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COMMODORE

ARGUS SPECIALIST PUBLICATIONS

FEBRUARY 1987 £1.10



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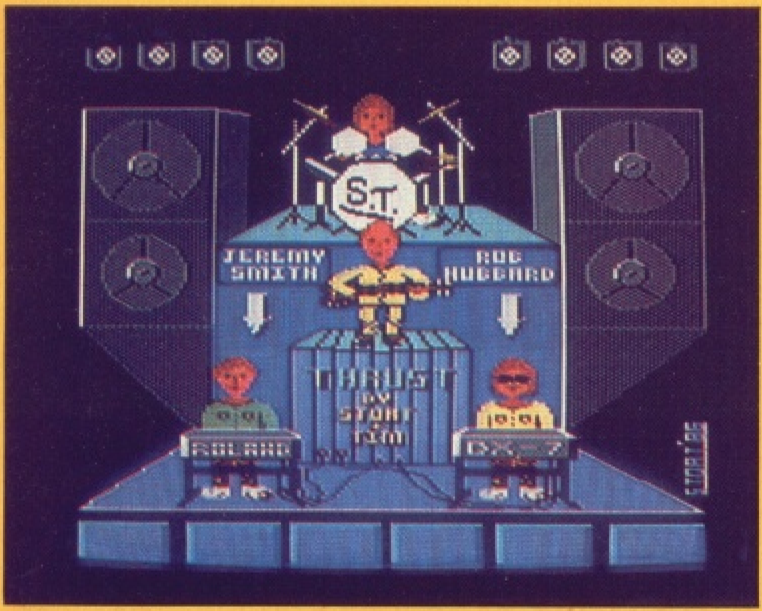


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Multiple levels of play, realistic pin action and automatic scoring make 10th Frame a bowling reality the whole family can enjoy. You may even be tempted to invest in high time bowler shoes and shirt once you've become obsessed with this addictive game.
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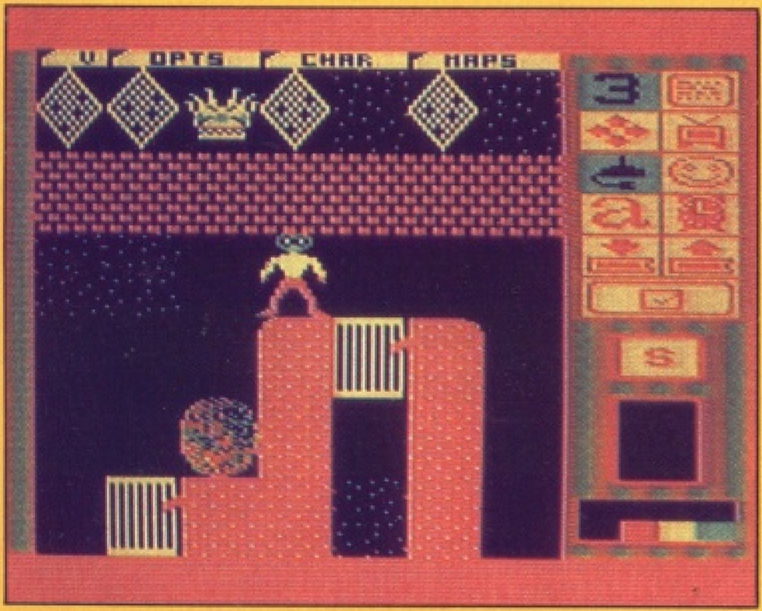
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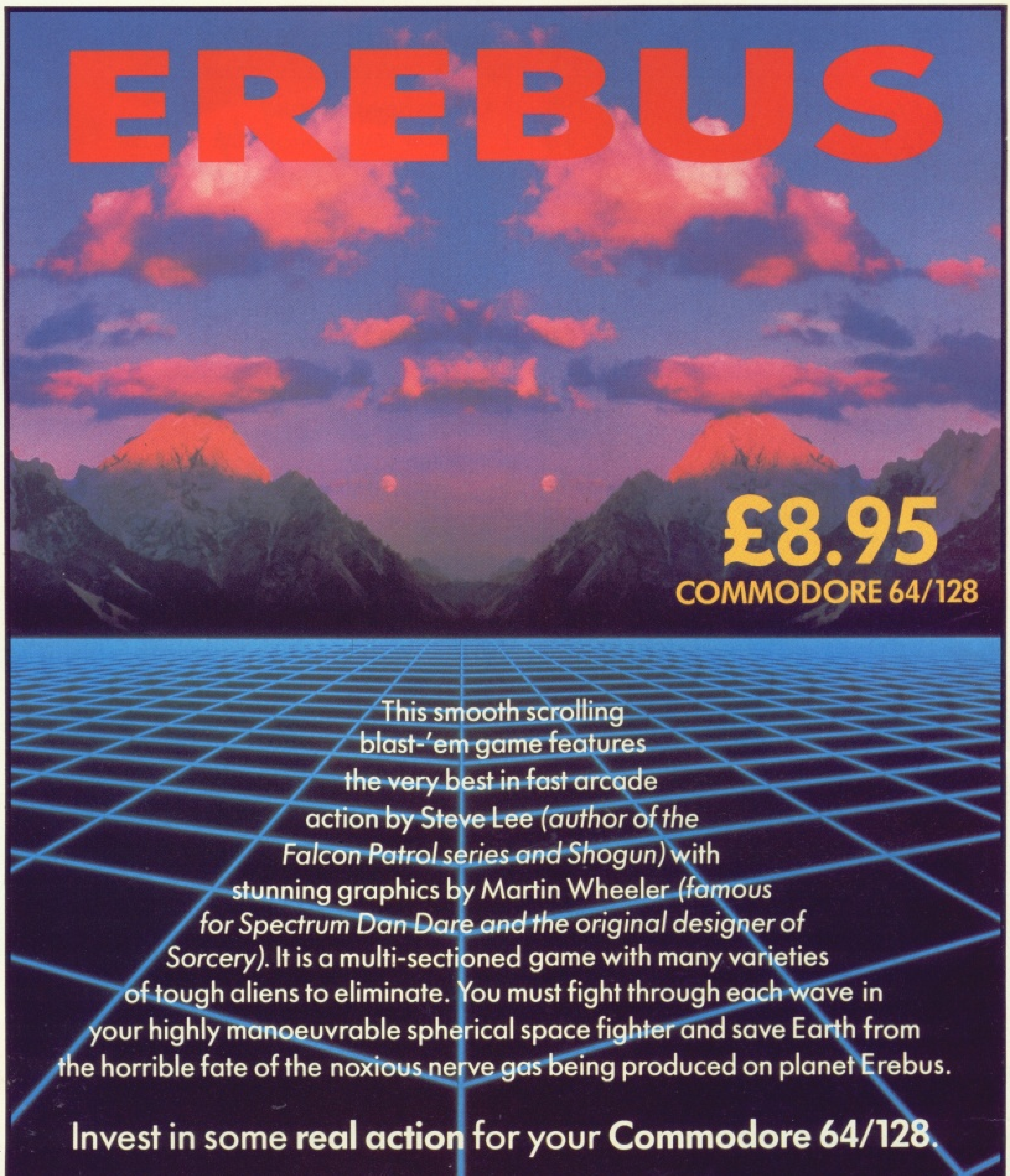
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EREBUS
£8.95
COMMODORE 64/128
This smooth scrolling blast-'em game features the very best in fast arcade action by Steve Lee (author of the Falcon Patrol series and Shogun) with stunning graphics by Martin Wheeler (famous for Spectrum Dan Dare and the original designer of Sorcery). It is a multi-sectioned game with many varieties of tough aliens to eliminate. You must fight through each wave in your highly manoeuvrable spherical space fighter and save Earth from the horrible fate of the noxious nerve gas being produced on planet Erebus.
Invest in some real action for your Commodore 64/128.

DATA STATEMENTS

Into the Arcades

Shoot 'em ups seem to be proliferating at the moment and are as popular as ever with the punters. Martech has brought out a zany game called *Cosmic Shock Absorber* based around the character of the same name – also defined as a fourth division hero. It will be available for the C64.

Another unlikely hero is Inspector Gadget of children's TV cartoon fame.

Inspector Gadget is determined to pursue the agents of MAD who are at the moment taking over the circus. MAD have planted bombs over the circus and you, as Inspector Gadget, have to find and defuse them. If a bomb explodes you lose a life. The title of the game is *Inspector Gadget and The Circus of Fear*. It will be on the streets very soon for the C64 on cassette for £9.95 and disk for £14.95 and is from Melbourne House.

Another unashamed shoot 'em up is *Sigma 7* from Durrell software. Durrell describe the new game as a traditional shoot 'em up with todays demanding standard for graphics and sound. To increase your chances of success it can be played with an autofire joystick to avoid those cramps in your hand. *Sigma 7* is also for the C64.

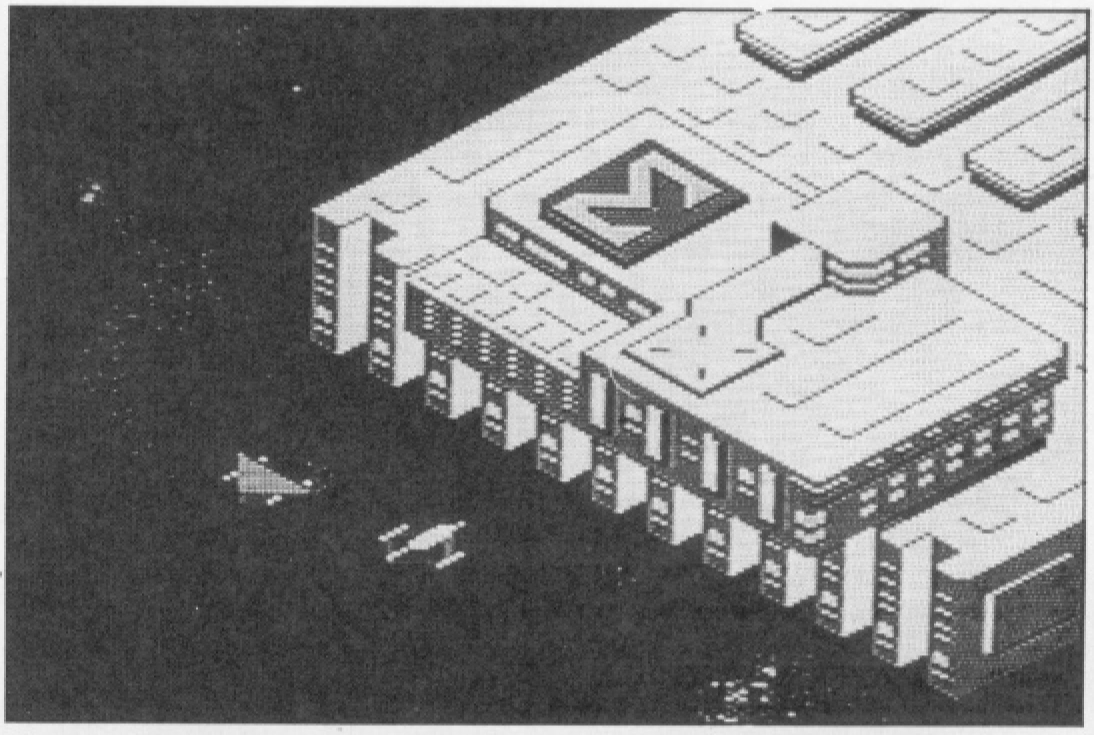
Ball Breaker is a new arcade game for CRL which has a familiar feel to it.

The player controls a bat which hurls a ball against a wall of bricks. The objective is to destroy the wall and then to proceed to the next levels to repeat the task. Different coloured bricks cause the ball to react differently – some bricks send the ball off at an angle, others cause it to change speed or even break in half. An added dimension is that demolishing some walls releases monsters who then have to be killed.

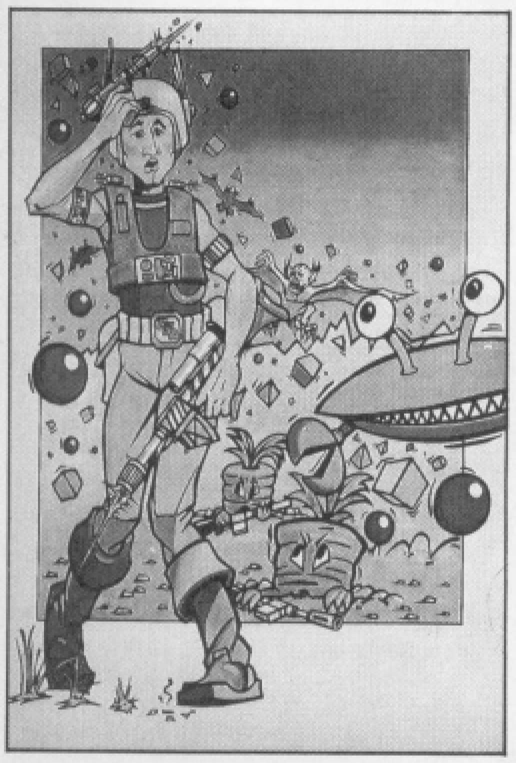
It will be available for the Commodore 64 on cassette at £7.95 and disk at £14.95.

Touchline

Martech: *Martech House, Bay Terrace, Pevensey Bay, East Sussex. BN24 6EE.* ***Tel:*** *0323 766616.*
Melbourne House: *60 High Street, Hampton Wick, Kingston-upon-Thames KT1 4DB.* ***Tel:*** *01 943 3911.*
Durell: *Castle Lodge, Castle Green, Taunton TA1 4AB.* ***Tel:*** *0823 54489.*
CRL: *9 Kings Yard, Carpenter's Road, London E15 2HD.* ***Tel:*** *01 533 2918.*



If it moves shoot it – Sigma 7



Cosmic Shock Absorber, new from Martech.

The Commodore Show

The 9th Official Commodore Show was held at the Novotel, Hammersmith, London in November. We were happy to welcome our readers to our stand and would like to say thanks for everyone's comments (both good and bad, although we were pleased to note that most of you are happy with the direction that the magazine is taking).

Ben Wellbay brings you the punter's point of view.

Visitor's View

On entering the building on a very cold and windy day, we were not really surprised to see scantily clad females ready to thrust the official Show Guide in our hands. What we were surprised about was that the Show Guide was free and so we ventured forth with raised hopes for a reasonably good show.

Alas this was not to be. We were immediately aware of the distinct lack of exhibitors, and the few modest stands that were occupied, seemed to be very similar both in content and theme. One really wonders why, when Christmas was so close and the show not clashing in any way with similar functions, so many of the larger Commodore dealing enterprises were noticeably absent. Is Commodore really becoming the dinosaur of the computer industry?

However, grumbles aside, mention must be made of the exhibitors who were present. First impressions of these

DATA STATEMENTS

were that most stands were offering generally outdated software or printer accessories at very low prices. The noisiest stand, meant in the nicest possible way, must have been Colleen's bit of floor. Colleen was promoting its *Music Creator* – an excellent package which contains a full tutorial on the rudiments of music together with the actual creator disk. Simple to use, the beauty of this program is that any music or sound effects so created can be saved in compiled form and used as an individual module within your own programs. A beautiful rendition of Vangelis was being played through the stereo system, and a free copy of Colleen's Quilled adventure game, *Mystery Voyage*, was given with every purchase of the *Music Creator.*

Trilogic was in evidence at the foot of the stairs promoting *The Expert Cartridge* and the new anti-freeze *ESM Module* together with other add-ons. When we went upstairs to the larger area, we located Evesham Micros, demonstrating the excellent *Dolphin DOS* a very nifty chip which speeds up disk access so much that it's frightening! It could be seen in action within 1541, minus its lid, and it really was most impressive.

Moving to the Supersoft stand, we could hear the strains of music belting out of the everso expensive *Microvox Digital Sound Editor.* We also noticed a few young budding Cozy Powells practising their art on the Rhythm King a neat little package available on cartridge and disk/tape.

Even though there were several stands showing off the almost unlimited capabilities of the glorious Amiga, it was well n igh impossible to get close enough to one in order to sample the remarkable demo software being exhibited. It is disheartening to realise that this machine is still beyond the reach of most buffs even with the price reduction, but then when you see it in action, perhaps it does justify the price tag.

Overall the show was quite disappointing although those exhibitors who did turn up tried in almost every case to cater for everyone's needs and were in general very helpful. Bargains were to be had for the more discerning punters, prices varied considerably from stand to stand (for instance the tape version of Crystal Castles was on sale for £9.95 and £5).

I personally would hope for a more responsive attitude from the larger software houses in the near future to make greater effort in attending these shows, and would sincerely trust that the 10th Official Show will be more useful to all parties concerned, exhibitors and customers alike.

Non-Physical Exercise



Brian Clough takes on the software charts.

Brian Clough's Football Fortunes from CDS is a computer game with a difference because it's a board game. It combines the speed and flexibility of a computer with the social aspects of other best-selling board games. Plus the gace that it was written with plenty of advice from Brian Clough himself.

Two of five players take on the roles of team managers. Each one must steer his team successfully through the season and use his skill to make his team stronger. Some of the opposing teams are managed by fellow players, the rest of the 10 team league is taken by the computer.

The game package consists of a computer cassette or disk, a playing board, five coloured counters, a pack of football player cards, immunity cards and a heap of money. Release date is 14 January and the C64 version will cost £14.95 cassette and £17.95 disk.

Now for the inevitable martial arts release.

Fighting Warrior is from Melbourne House and is now available in C16 format., As *Fighting Warrior*, champion of Egypt, you must use all your combat skills to rescue the beautiful princess. Armed with just a word you are faced with ordeals and challenges from various creatures which cross your path. It's in the shops now and is £5.95.

Touchline

CDS: *CDS House, Becket Road, Doncaster DN2 4AD.* ***Tel:*** *0302 21134.* ***Melbourne House:*** *60 High Street, Hampton Wick, Kingston-upon-Thames, Surrey, KT1 4DB.* ***Tel:*** *01 943 3011.*

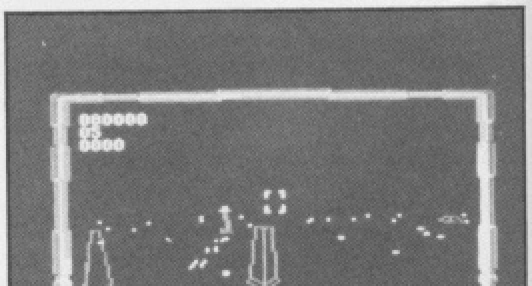
Space Age

Into the realms beyond the atmosphere for a look at another batch of zappy games.

CRL's latest space action game is called *Death of Glory*. The player is the pilot of a Space Dozer, a small craft which clears up space, keeping it safe to travel in. Whilst out on route an invading fleet is discovered. There is no time to raise the alarm, the only action possible is to take them on alone. The only way to attack is ram the ships. The cassette version for the C64 is £8.95 and the disk version is £14.95.

Starglider is a new science fiction game from Firebird. It's an air-to-air air-to-groun flight simulation set on the planet Novenia.

Your task is to destroy the flagship, Starglider, of the marauding Egron fleet. Low level flying, defence and

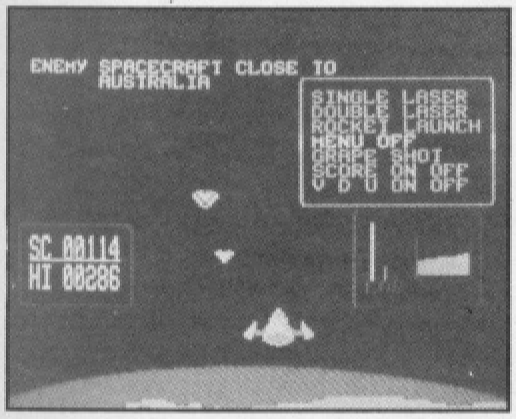


Great graphics in Rainbird's Starglider.

attach manoeuvres and survival techniques are all part of the action. The C64 version is £14.95 on cassette and £17.95 on disk.

In Mind Games' newest release, you are once more the lone hero attempting to safeguard the existence of the human race. *Mission Omega* is an action strategy game in which you must intercept a radioactive alien invader which is rapidly closing in on the planet earth. Because of the lethal radioactivity of the invader you must us robots to carry out the shutdown of the reactor by remote control. These are specially designed for the task however their movement is programmed by you. Available now, *Mission Omega* is for the C64 and is on cassette for £9.95.

Quicksilva's latest game *Defcom*, looks at the possibility of aliens taking over the USA's defence satellites in the future and using them against the very



Defend the USA with Defcom – new from Q.S.

countries which they were meant to protect. The only way in which to regain control of the satellites is for one man to take them all on in his Eagle Class E751 fighter with the recently developed single beam – High Intensity – Anti-Aircraft weapon. The mission, nicknamed Reagan's Run, is taked on by Nick Diamond, a leading space acrobat.

Defcom is available now for the C64 at £8.95.

Erebus from Virgin Games is also a space scenario blasting game. *Erebus*, a planet which has been used to convert earth's waste materials into useful gases and chemicals has now been utilised by the aliens from the neighbouring planet of Hadebus to produce a noxios nerve gas to obliterate the earth's population. The refinery is split into different levels of circular sections, interlinked by dimension ducts. You must completely orbit each section, eliminating as many aliens as possible and then gain access to the dimension duct. The game is £8.95 and is for the C64.

Touchline

CRL: *9 King's Yard, Carpenter's Road, London E15 2HD.* ***Tel:*** *01 533 2918.*
Rainbird: *74 New Oxford Street, London WC1A 1PS.* ***Tel:*** *01 240 8838.*
Mind Games, Quicksilva: *Victory House, Leicester Place, London WC2H 7NB.* ***Tel:*** *01 439 0666.*
Virgin Games: *2-4 Vernon Yard, Portobello Road, London W11 2DX.* ***Tel:*** *01 727 8070.*

War Gaming

PSS, the software house, which specialises in war games has added two new releases to its extensive range.

The Annals of Rome is a vast strategy game based on the rise and fall of the Roman empire. The game starts in the year 273 BC, when the Romans had just gained control of Italy. Your role is that of the ruling power in the Roman senate deploying commanders and troops in successive foreign and civil wars.

At any time you may be faced by up to 13 hostile enemies each fighting to extend its own sphere of influence. Your enemies are as diverse as the barbaric gauls and the sophisticated Carthaginians.

At your disposal you have the incomparable Roman Citizen Legionaires and 21 individual officers of a wide range of ability and loyalty.

The Annals of Rome is a phased game and is controlled via the keyboard. It will be available for the C64 in the spring.

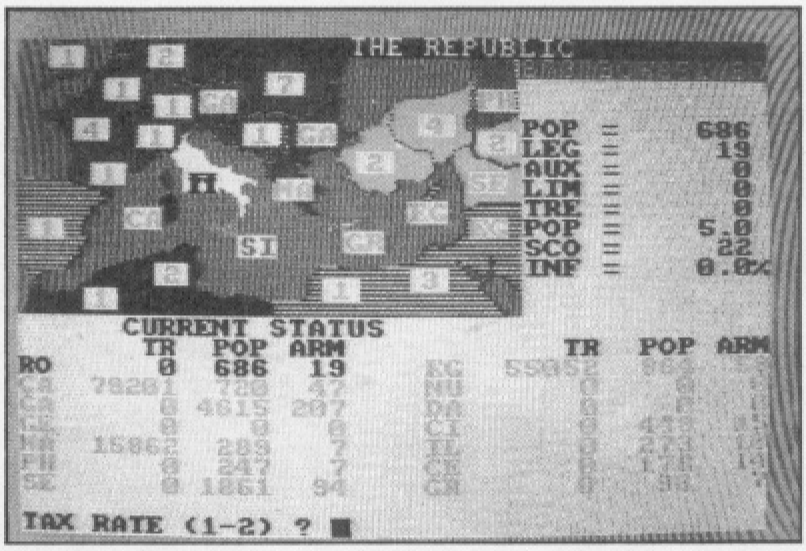
From American Action is *'43, The Year After*. One Year after the Battle for Midway, the war is still raging in the Pacific. The Japanese Kamikaze pilots are at their worst. Commander R.B. Wildfox selects you, Bertram M. Digdale, the former elite pilot, to patrol the most dangerous part of the Pacific Ocean. Features include, smooth fast graphics, status and map windows, landbases as well as carriers and 999 levels and over six hours of background scenarios. Out now for the C64 on cassette on £9.95 and disk at £14.95.

Into the realms of fantasy with a new strategy, fast action game from Rainbird. *Tracker* is a tactical battle against an artificially intelligent enemy combining a high degree of strategy in a fast action 3D game.

The top half of the screen in *Tracker* shows an enlarged map of the start area and the bottom half displays a long range map. This shows the positions of the red Cycloids, the yellow communications links and communications centres. Plus the sectors and positions of you eight skimmers. Your ultimate target is the large enemy headquarters. It's now available for the C64 on cassette (£14.95) and disk (17.95).

Touchline

PSS: *452 Stoney Stanton Road, Coventry CV6 5DG.* ***Tel:*** *0203 667556.*
American Action: *Box 10090, S-200 43, Malmo, Sweden.* ***Tel:*** **36 4023 25 20.*
Rainbird: *74 New Oxford Street, London WC1A 1PS.* ***Tel:*** *01 240 8838.*



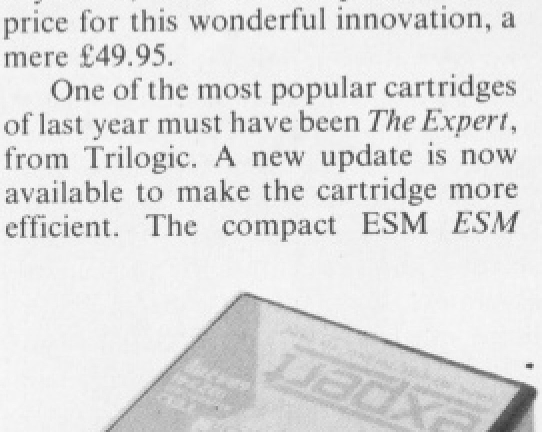
Watch the ups & downs of the Roman Empire in the Annals of Rome.

DATA STATEMENTS

Products and Accessories

In the winter months that fiend, that most hated enemy of computer owners, rears its ugly head once more. Static Electricity. The cause of thousands of pounds worth of damage to computers both in the home and in the office. Perhaps the *Static Buster* could solve your problems. Produced by Integrity Solutions, this gadget may be able to save you money and frustration. Integriry Solutions press statement claims: "The simple act of walking over a carpet can generate a frightening 35,000 volts. Transmit that from your fingertip into a personal computer and the results can be devastating." *The Static Buster*, acting like a sponge, diverts electricity from the three vital elements of computer operation, from the three vital elements of computer operation, the keyboard, screen and operator. The price for this wonderful innovation, a mere £49.95.

One of the most popular cartridges of last year must have been *The Expert*, from Trilogic. A new update is now available to make the cartridge more efficient. The compact ESM *ESM*





Module is fitted with LED, push button and connector. It fits between the cartridge port and *The Expert*



▲ *Posh computer furniture from Twinlock.*

New addition for the expert cartridge.

cartridge and has no effect on action and can be left connected and otherwise ignored. It's available by mail order and costs £7.95 including postage and packing.

And if you need somewhere to put all your equipment, then maybe you'll want to invest in light oak laminate computer furniture from Twinlock. The surfaces of the furniture are wipe clean and heat resistant and the bases are constructed from strong tubular steel fitted with castors at the rear for mobility and anti-skid front legs and stability in operation.

Touchline

Integrity Solutions: *504 Manchester Road, Sudden, Rochdale OL11 3HE.* ***Tel:*** *0706 34535.*
Trologic: *329 Tong Street, Bradford BD4 9QY.* ***Tel:*** *0274 684289.*
Twinlock: *36 Croydon Road, Beckenham, Kent BR3 4BH.* ***Tel:*** *01 650 4818.*

Pocket Money Prices

Finally, a quick look at a few budget games to see you through a lean period.

Sparklers have released five C16 games at £1.99 each. *Java Jim* is for the C64 and is about an archaeologist, Idaho Jim, in pursuit of hidden treasures from the past inside an active volcano.

Slurpy is about a greedy creature from the planet Gluton who explodes if he has to much nosh. Also for the C64. *Orc Attack*, another C64 game, is the classic story of castle seige by the demon orcs who terrorise the land, and *River Rescue* is a fast chase down a river dodging rocks and mines to reach a safe haven.

Bug Byte has launched six Commodore Titles. *Deathwake, Falcon patrol II, Strangeloop* and *Alien* for the C64 and *Zagan Warrior* and *Aardvark* for the C16. All are priced at £2.99.

Touchline

Sparklers: *Unit B11, Armstrong Mall, Southwood Summit Centre, Southwood, Farnborough, Hants ONP.* ***Tel:*** *0252 522200.*
Bug Byte: *Victory House, Leicester Place, London WC2H 7NB.* ***Tel:*** *01 439 0666.*

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PACK OF 12 COMMODORE 64 EDUCATIONAL TITLES

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PACK OF 10 CBM64 CASSETTE/CARTRIDGE GAMES

Labrynth, Stop the Express, Humphrey, Buffalo Round Up, Harbour Attack, Pandora's Box, Star Post, Star Ranger, Radar Rat Race, Avenger, plus Quickshot II Joystick. £39.95

COMMODORE 64 COMPENDIUM PACK OFFER

Commodore 64, C2N Data Recorder, Music Maker Keyboard, Designer's Pencil, Adrian Mole Game and Book plus Pack of 12 Educational Titles or Pack of 10 Games Titles. £199.95

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1541C DISC DRIVE OFFERS

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1541C with 6 Infocom Disc Adventure Games* £199.95

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1541C with Quick Brown Fox Wordprocessor, Easyfile Database and Future Finance Planning Package. £199.95

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SUPERBASE OFFERS

SUPERBASE, the world's top Commodore database, provides applications ranging from a simple to use filing system to a highly advanced fully programmable database. Combined with SUPERSCRIPT, SUPERBASE provides a complete integrated office system.

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SUPERBASE STARTER, the simplified version of SUPERBASE, providing the same features except for programming capability. Includes label printing and easy to use manual. £19.95

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First in-depth guide to this power database, from first steps to advanced programming. Required reading. £11.95

*Please see opposite for Superscript and combination pack prices.

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The ultimate graphics utility for the 64/128

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By far the best such package for the CBM64 — the hardware is excellent, the software technically stunning — PCW

The best mouse for the 64 so far — combining high standards of engineering with very clever, efficient and creative software — CCI

POWER CARTRIDGE

Utilities Cartridge including Toolkit, Monitor, Tape and Disc Turbo, Extensive Screen Dump to Printer facility (including games screens), Reset Switch and Back-up Routine £39.95

ACTION REPLAY

Powerful Back-up Utility Cartridge including Tape to Disc, Disc to Disc, Tape to Tape, Disc to Tape plus Turbo Disc Loader and Reset Switch £24.95

AT LAST! CBM 64/128 PRINTER BUFFERS

Automatically downloads information from computer, enabling you to continue processing while text is printing. Compatible with all Commodore Printers.

32K (approx. 16 pages of text) £69.95
64K (approx. 32 pages of text) £89.95

COMMODORE MUSIC SYNTHESIS PACKAGE

SOUND EXPANDER
This module, used via TV or external amplifier, uses FM chips which are significantly more powerful than the Commodore's SID chip. The eight available channels produce extremely realistic sounds, allowing complex chords and melody lines. Driven by pop-down menus, the powerful sound facilities of the expander create a viable composing tool.

5 OCTAVE KEYBOARD
Professionally-built with full-size keys to utilise the above modules.

SOUND STUDIO
This powerful synthesis software contains a stored library of 60 sounds and the ability to create your own sounds via screen menus. It also contains a multi-track recording facility with powerful 6-track midi sequencer.

This package represents a breakthrough in computer-controlled synthesis and compares in quality and specification with systems costing many times the price.

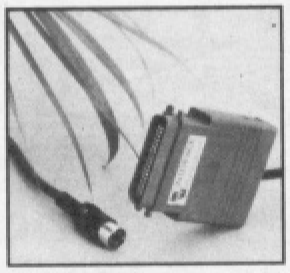
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COMPOSER/EDITOR SOFTWARE

For sound expander system. This extremely powerful duo allows the creation of your own sounds in an uniquely simple way, plus up to 9 part composition on screen with manuscript print facility. Midi Compatible.
Tape or Disc. £24.95

Up to date Info: C64/C128

The Printerinterface



Runs with all popular software.
Guaranteed. Make sure the one you buy can be relied on to do the same.

92000/G,
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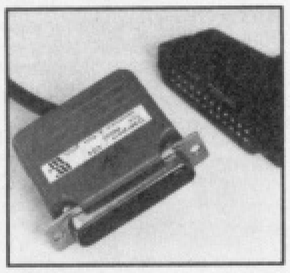
Printerbuffer



A must for business use.
Speed your computer systems by up to 95%. Runs immediately with all your existing softzware.

99032, 32KByte: £70.00
99064, 64KByte: £90.00

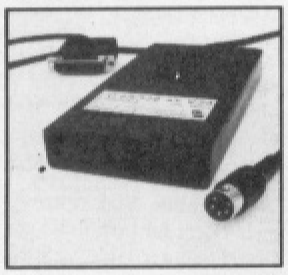
Lowcost V24/RS232



Your C64/C128 already has a built in serial interface! All you need is a driver program and this interface to provide the correct voltage levels for standard RS232 devices.

88002: £35.00

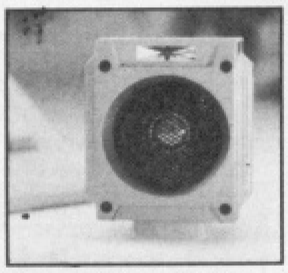
Intelligent V24/RS232



With its own processor and a 64KByte buffer this simple to use device allows high data rates. Can even receive data while your computer is running other programs.

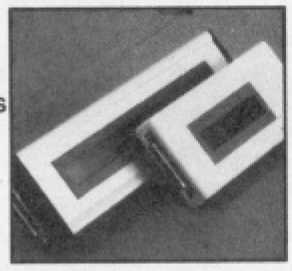
98064, 64KByte: £115.00

Soundbox



Most games have great sound - but not from your C64 or C128.
Soundbox - ready to plug in HI-FI amplifier with built in loud speaker.
Complete music enjoyment.
Low price.
95000: only £30.00

LC-Display



Small alphanumeric add-in display.
Use for cash registers, display machines states or a thousand other applications.
Connects to user port.
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Micro-Clerk
£99.99

This is a software package which provides all you need to computerise a small business. Running on the 80 column C128, MICRO-CLERK includes CASH BOOK accounting with full VAT management, profit and loss reports, trial balance etc., WORD PROCESSING with MAIL MERGE, FILING and CALCULATING. Also included are many utilities to reduce the clutter on your desk, JOTTERS, ADDING MACHINE with VAT constant, and much more **all for £99.99.**
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Petspeed 128

Writing programs in Basic is far easier than using machine code but the programs are also a lot slower. This new offering for the C128 will turn your Basic programs into machine code for extra speed.

No matter what type of program you want to write it is far easier to tackle it in Basic than by using machine code. Writing in Basic on the C128 is even easier than its predecessor the C64 since it has a plethora of built in sound and graphics commands. However, there's one big problem, a Basic program is excrutiatingly slow. There's nothing worse than writing your latest space shoot-em up only to find that your hyper-galactic star cruiser takes no less than two minutes to go from one side of the screen to the other.

Petspeed 128 is a Basic compiler program. A compiler takes a Basic program and turns it into a machine code program increasing the speed of operation dramatically. The manufacturers of this package claim that it is possible to increase speed of operation by up to 40 times.

Loading the program into the computer is a total bind. The disk isn't protected but there is a colour chart that you are asked for three colours from as a form of protection. I find this type of protection annoying and difficult to use. A friend who is colour blind only managed to get the program up and running once. Personally I would rather have the disk protected and be able to LOAD the program with ease.

Compatibility

Obviously there must be some incompatibility between the compiler and the standard C128 Basic. Fortunately these are all quite minor and should cause no great headaches. Examples of the type of instruction that have to be altered are:

Arrays must be dimensioned at the time of compilation. You can not therefore have a command such as:

```
10 INPUT A: DIM N(A)
```

instead you would have to decide what A should be before you compile the program and enter it as

```
10 DIM N(100)
```

Basic instructions that use a line number as an argument, eg. RESTORE, require a constant after them rather than an expression. For example RESTORE N+1 would not be allowed.

RESUME NEXT is not supported.

As you can see none of the above should cause any problems and any occurrences of the above can probably be changed very easily.

Added Extras

A number of extra commands have been added to the C128's Basic in order to make use of the compiler more efficiently, the following are examples of some of the new commands.

1) User defined string and mixed functions are available. For example: DEF FN A (X$) is now allowed.

2) You can have integer FOR NEXT loops which will give an increase in speed.

3) The !LN name will make all the letters of a variable name significant. Usually the C128 only takes not of the first two.

And there are many others including commands to disable and enable the STOP key, the & command which will allow input to be taken from a disk file. The % instruction allows the use of other companies' Basic extensions.

Other Benefits

As well as speed there are a number of other benefits to using a compiler over standard Basic. For a start the !LN command allows you to use strings that use the same letters to start with, something that you can't normally do. This means that your programs can be made more readable since you can use variable names that actually mean some thing such as SCORE.

Sorting Out Errors

When a *Petspeed* program is RUN and it comes across an error you will be given a report just like a Basic program. However, there's one small problem. Petspeed programs don't have lie numbers only addresses so how are you going to find out where your problem is?

A program called ERRORS that is suplied on the program disk will look through a special *Petspeed* file and tell you in what line the error occurred and try to give you an indication as to where in this line the error was. Now all that you need to do is LOAD the original Basic program, find out what caused the error, correct it and compile the program again.

Verdict

Petspeed 128 is a program that is a must in any C128 owners software collection. OK so you may write all your programs in code but wouldn't it be quicker to write some of your programs in Basic and the compile them? If you are fairly new to computers and are just getting to grips with Basic then *Petspeed* gives you the opportunity to speed your program up. YC

Touchline

Name: *Petspeed 128.* ***Supplier:*** *Systems Software (Oxford) Ltd.* ***Price:***


SIGMA 7
Commodore 64 available November 20th
Spectrum & Amstrad available February
Sales dept.,
Castle Lodge, Castle Green,
Taunton, Somerset TA1 4AB
England Telephone (0823) 54489 & 54029
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Club 128

News from Compunet of new deals and new directions to keep you interested.

By Neil Day

Interesting things are afoot at Compunet. Following a huge increase in the number of subscribers after the special free modem offer, the service is now on the point of a major expansion. A new mainframe, dedicated to the network, is proposed which will easily accommodate the increased numbers of users. The upside is the promised improvement in speed and service. The down side is the wait! Because the software running the system has to be largely rewritten, the new dedicated system won't be available until the projected date of mid 1987.

Recent deals offered by Compunet suggest that the network might be going in some interesting new directions. One offer to Gold subscribers is 10,000 page/days for an additional payment of £10 above the quarterly charge of £15. User-selectable names and banners are now available. Another new service will provide closed user groups which would allow a number of users exclusive access to an otherwise protected area. Part of the present ICPUG area operates in this way.

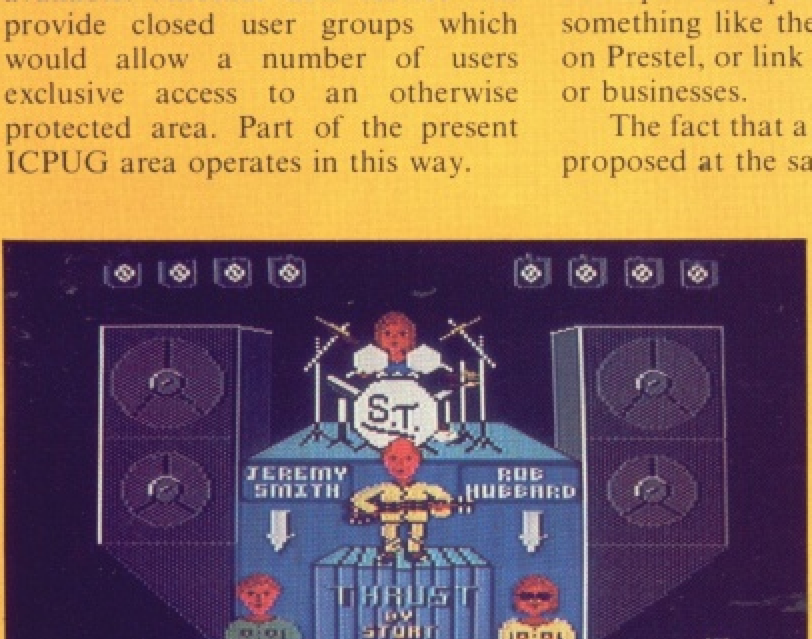
It is interesting to speculate about who such services could be directed at: surely not spotty, juvenile, whizzkid machine code programmers of all ages who hog the family telephone while they update the latest diagonally scrolling 15 mega-zap demo with 27 channel sound. I'd speculate that large-scale information providers are being courted with these offers. Perhaps Compunet has in mind something like the travel agents area on Prestel, or link up between schools or businesses.

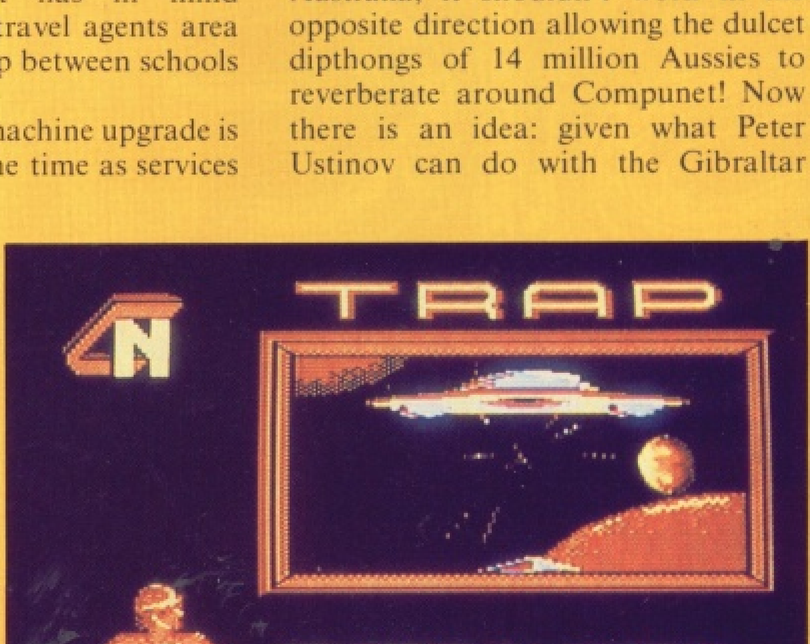


The fact that a machine upgrade is proposed at the same time as services are being extended in this way may lend some weight to these speculations.

One development projected for the short term is the establishment of an ISTEL node in Eire. This may well be set up by the time you read this. It is rumoured that the charge will be slightly higher than the node in Britain.

Again it is interesting to speculate about implications and future directions. The International Packet Switching Service allows me to log into a computer in Melbourne. Australia, for £6 per hour plus a small charger per byte of data transmitted. Electronic mail can be used to transfer files if large amounts of information are to be exchanged. This is cheaper still, and takes about 20 minutes. There is no apparent technical reason why, if this will work from UK mainframes to Australia, it shouldn't work in the opposite direction allowing the dulcet dipthongs of 14 million Aussies to reverberate around Compunet! Now there is an idea: given what Peter Ustinov can do with the Gibraltar





Grand Prix, think of the comic possibilities of a multinational and multi-lingual Compunet Partyline Session!

Leaving futurology and returning to the Compunet of the here and now: There has been a lot of activity in the Network recently. GOTO PSION will take you to a very interesting new area for owners of the Psion Organiser, the pocket computer with inbuilt database software that seems to weave its insidious way so far into the owners' lifestyles that its just not worth their getting out of bed if the thing breaks down! As you'll gather, I don't have one myself, but seeing the information, programs and applications that FD1 has uploaded in the PSION area shows just how versatile this little beasty is.

There are several frames about interfacing the Psion organizer to the C64 using a serial interface. You often hear about this sort of thing being possible, but FD1 describes exactly how he did it. Files prepared with Easyscript or any other wordprocessor can be transferred from the C64 into the Organizer, overcoming one of the main objections to pocket size computers: the sub-finger sized keyboards that make them infuriating to use.

As well as this general information, FD1 had a directory of Procedures that includes a number of file handling routines for the Psion Organizer, a program to list the diary stored in it, and, a couple of other programs to calculate petrol consumption and a timer and cost calculator for phone calls. Many thanks to FD1 who has made all this information available for CNetters free of charge.

Among the many hundreds of additional items do check JMS4's GOOD GOTOS guide: you'll find it a directory on the first page if you GOTO GOTOS. These frames, now free of charge, provide a comprehensive list of what is available on Compunet, and classify some programs. The list of Utilities in Good Gotos 2 is particularly impressive. The large number of votes shows that users are hoping JMS4 is able to maintain this excellent service. JMS4 asks that you courier him when you upload anything of interest.

GOTO VISION and get a really unobstructed view of the previously hidden tonsorial interests of la famille Wino. Be warned however that these uploads come within a whisker of being risque and may make some readers bristle.

If any of the uploads mentioned here is not available at the location given, please check the Club 128 update frames you'll find after GOTO YRCBM. If you find or upload anything that is vaguely non-recreational and likely to be of interest to Club 128 readers, please courier me on NAD2. YC

Turbo Menu Maker

In a new series we bring you a selection of short utilities which should be invaluable for anyone wishing to handle large amounts of data.

By Les Allan

Anyone wishing to store and process a lot of data is bound to come across numerous problems in an attempt to sort it into an accessible and economic form. This short series of utility programs is designed to place facilities at your disposal which will do just that. The first item is a Turbo Menu Maker.

Turbo Menu Maker

This routine reads the current directory from disk and rearranges it such that the MENU file is saved as the first file and a straight line as the second. If the total number of files read is less than 64 then the process can be continued. This is because sufficient room (eight blocks) must be kept clear for the MENU program in the directory.

A directory sort routine is selectable between either an alphabetical or manual sort. The alphabetical sort ranks the directory in alphabetical sequence prior to re-writing the directory. Whereas the manual sort provides, in addition to the user being to determine the sequence, the facility to insert a separating line/lines in the sorted directory. The type of separating line used is defined by the user from a keyboard character - if RETURN is pressed the default is a straight line. It should be realised that the limitation of 64 entries also applies to the addition of separating lines.

Choosing Files

The choice for the MENU saved files is then made by selecting 'Y' of 'N' to each of the directory files. The count of the total number of selected files is indicated adjacent to the current files and providing the selection does not exceed 64 in total then the process can be continued.

The directory plus the MENU straight line is then saved to disk.

The MENU program is then read from memory in 254 byte sections and written to the directory from the next vacant sector in the sequence.

The program, once loaded, displays only those filenames that were chosen. These are selected with the cursor keys and entered by RETURN. The program then loads at a turbo rate of approximately five times with a flashing screen to indicate that a successful load is taking place.

The program as listed must be typed in exactly as written and saved prior to running. Error trap routines are included to ensure that the data as read is correct. The program when run stores the relevant code at a temporary address of $8000 and when prompted relocates the working program to Basic ($0801) and saves to disk the program TURBO MENU V3.0. YC

PROGRAM: TURBO MENU MAKER

Please read LISTINGS before entering this program

```
34  10 M1=32768:M2=39248:CH=0
97  11 PRINTCHR$(144)CHR$(147)
C8  12 POKE52,120:POKE56,120:POKE
    53280,15:POKE53281,12
94  13 PRINT
8F  14 PRINTSPC(8)CHR$(18)"[SU,S*
    22,SI]
26  15 PRINTSPC(8)CHR$(18)"[S-,SP
    C22,S-]
B4  16 PRINTSPC(8)CHR$(18)"[S-,SP
    C4]DATA  STATEMENT[SPC3,S-]
3C  17 PRINTSPC(8)CHR$(18)"[S-,SP
    C22,S-]
E5  18 PRINTSPC(8)CHR$(18)"[S-]
    TO MEMORY  ROUTINE  [S-]
4A  19 PRINTSPC(8)CHR$(18)"[S-,SP
    C22,S-]
22  20 PRINTSPC(8)CHR$(18)"[S-,SP
    C5]BY LES ALLAN[SPC5,S-]
50  21 PRINTSPC(8)CHR$(18)"[S-,SP
    C22,S-]
6C  22 PRINTSPC(8)CHR$(18)"[SJ,S*
    22,SK]
A0  23 PRINT:PRINTCHR$(155)
42  24 PRINT" THIS ROUTINE READS
    THE DATA STATEMENT,"
80  25 PRINT
17  26 PRINT" CONVERTS FROM  HEX
    TO BINARY AND POKES"
82  27 PRINT
C4  28 PRINT" CODE BACK  TO THE
    AREA OF MEMORY FROM"
84  29 PRINT
19  30 PRINT" WHICH  IT  WAS  PRE
    VIOUSLY  GENERATED."
59  31 PRINT:PRINT
D0  32 READCODE$
BB  33 LB=ASC(RIGHT$(CODE$,1))-48
    :IFLB>9THENLB=LB-7
CF  34 HB=ASC(LEFT$(CODE$,1))-48:
    IFHB>9THENHB=HB-7
32  35 PRINTSPC(5)CHR$(5)"READING
     MEMORY BLOCK ...";M1:PRINTCH
    R$(145);
28  36 POKEM1,HB*16+LB:M1=M1+1:CH
```

```
     -CH+HB+LB:IFM1<M2THEN32
EB   37 IFCH=90466THEN39
13   38 PRINT"CHECK SUM ERROR - CH
     ECK DATA STATEMENTS!":PRINTCH
     R$(19):END
EC   39 PRINT"  HIT RETURN TO SAVE
      COMPLETED PROGRAM"
D1   40 GETKEY$:IFKEY$<>CHR$(13)TH
     EN40
63   41 SYS39152
10   42 :
CE   43 :::::::::::::::::::: DATUM S
     TATEMENTS ::::::::::::::::::
16   44 :
AD   45 DATA 00,0B,08,00,00,9E,32,
     30,36,31,00,00,00,20,44,E5
2C   46 DATA A9,0C,8D,20,D0,8D,21,
     D0,EA,A9,36,85,01,4C,05,20
84   47 DATA 7C,07,02,F4,7E,77,7F,
     74,7C,08,0B,F4,07,02,EC,73
56   48 DATA 77,75,7C,08,15,F4,ED,
     77,7C,0B,15,F4,76,46,3B,4E
E0   49 DATA 44,46,02,62,F4,64,55,
     57,19,FA,64,7C,05,62,F4,64
38   50 DATA 64,7C,C7,1E,F4,77,E2,
     77,75,7C,05,62,F4,05,62,EC
66   51 DATA 81,6E,76,6F,7C,C4,46,
     EF,4E,45,46,0A,62,F4,81,6E
5F   52 DATA 77,75,76,6F,EC,81,6E,
     77,7E,6F,EC,81,6E,76,6F,EC
FF   53 DATA 64,86,10,FA,64,46,F0,
     4E,42,46,0A,62,F4,0A,62,EC
0C   54 DATA 05,62,46,88,4E,43,46,
     D1,73,75,74,7E,76,6A,77,73
1E   55 DATA 7C,D1,73,75,74,7E,77,
     6A,77,74,46,98,4E,40,46,DF
6B   56 DATA 81,6E,7E,6F,81,6E,77,
     72,71,6F,46,40,4F,41,46,DF
FC   57 DATA E0,70,6F,64,54,D6,93,
     85,1A,FA,8F,46,6B,4F,4E,46
1E   58 DATA DF,E0,70,6F,64,54,D6,
     9B,66,1A,FA,9B,46,10,4F,4F
FA   59 DATA 46,DF,E0,70,6F,64,54,
     D6,9B,66,05,FA,12,13,14,04
4D   60 DATA 09,66,0B,03,08,13,66,
     0B,07,0D,03,14,66,05,FA,9B
A7   61 DATA 46,38,4F,4C,46,DF,E0,
     70,6F,64,54,D6,9B,66,04,FA
0D   62 DATA 60,66,02,0F,14,03,05,
     12,09,14,1F,66,15,09,14,12
5F   63 DATA 03,14,66,04,FA,9B,46,
     E0,4F,4D,46,DF,E0,70,6F,64
82   64 DATA 54,D6,9B,66,07,FA,10,
     03,14,15,0F,09,08,66,10,75
79   65 DATA 6B,76,66,07,FA,9B,46,
     88,4F,4A,46,DF,E0,70,6F,64
55   66 DATA 54,D6,9B,66,1A,FA,9B,
     46,B0,4F,4B,46,DF,E0,70,6F
DA   67 DATA 64,54,D6,9B,66,06,FA,
     04,1F,66,03,FA,0A,03,15,66
7A   68 DATA 07,0A,0A,07,08,66,06,
     FA,9B,46,58,4C,48,46,DF,E0
F3   69 DATA 70,6F,64,54,D6,9B,66,
     1A,FA,9B,46,00,4C,49,46,DF
62   70 DATA E0,70,6F,64,54,D6,8C,
     85,1A,FA,8D,46,16,4C,56,46
DA   71 DATA DF,7C,DF,7C,DF,46,39,
     4C,57,46,DF,64,DD,66,66,12
50   72 DATA 0E,03,66,02,0F,14,03,
     05,12,09,14,1F,66,0B,07,1F
34   73 DATA 66,14,03,6B,11,14,0F,
     12,12,03,08,66,11,0F,12,0E
06   74 DATA 09,13,12,64,46,EB,4C,
     54,46,DF,64,66,66,07,08,1F
FB   75 DATA 66,07,0A,12,03,14,07,
     12,0F,09,08,66,12,09,66,12
7F   76 DATA 0E,03,66,09,14,0F,01,
     0F,08,07,0A,66,15,07,10,03
24   77 DATA 02,64,46,9D,4C,55,46,
     DF,64,66,66,15,03,17,13,03
16   78 DATA 09,05,03,66,09,14,66,
     66,0F,12,66,05,07,08,66,04
5A   79 DATA 03,66,15,09,14,12,03,
     02,66,03,0F,12,0E,03,14,64
E4   80 DATA 46,4F,4D,52,46,DF,64,
     66,66,07,0A,16,0E,07,04,03
CC   81 DATA 12,0F,05,07,0A,0A,1F,
     66,09,14,66,0B,07,08,13,07
FE   82 DATA 0A,0A,1F,7D,66,0F,08,
     66,11,0E,0F,05,0E,64,46,71
D7   83 DATA 4D,53,46,DF,64,66,66,
     05,07,15,03,66,66,07,66,03
86   84 DATA FA,15,03,16,07,14,07,
     12,0F,08,01,66,03,FA,0A,0F
78   85 DATA 08,03,66,66,0B,07,1F,
     66,66,04,03,64,46,23,4D,50
14   86 DATA 46,DF,64,66,66,0F,08,
     15,03,14,12,03,02,66,04,1F
AE   87 DATA 66,12,0E,03,66,13,15,
     03,66,09,00,66,12,0E,03,66
3E   88 DATA 15,16,07,05,03,66,04,
     07,14,64,46,D3,4D,51,46,DF
AF   89 DATA 7C,DF,64,66,66,0B,07,
     1E,0F,0B,13,0B,66,08,13,0E
FE   90 DATA 04,03,14,66,09,00,66,
     0B,03,08,13,66,03,08,12,14
D3   91 DATA 0F,03,15,66,0F,15,66,
     77,70,64,46,8E,4D,5E,46,DF
BD   92 DATA 7C,DF,7C,DF,64,43,66,
     66,0F,08,15,03,14,12,66,02
FA   93 DATA 0F,15,0D,66,12,09,66,
     15,07,10,03,66,0B,03,08,13
14   94 DATA 66,6B,66,0E,0F,12,66,
     07,66,0D,03,1F,64,46,9C,4D
99   95 DATA 5F,46,CD,84,6E,77,7F,
     71,6F,F4,70,72,E1,74,73,46
34   96 DATA 4F,4A,5C,46,DF,64,D7,
     66,07,FA,14,03,07,02,0F,08
6A   97 DATA 01,66,05,13,14,14,03,
     08,12,66,02,0F,14,03,05,12
B5   98 DATA 09,14,1F,66,06,FA,64,
     46,66,4A,5D,46,D9,77,73,6A
AD   99 DATA 7E,6A,77,73,6A,64,0F,
     76,64,7C,CB,77,74,70,46,0A
F8   100 DATA 4A,5A,46,DE,77,73,6A
     ,64,15,76,7C,0B,03,08,13,64
89   101 DATA 7C,DE,77,73,6A,64,15
     ,76,7C,86,10,FA,64,46,2C,4A
49   102 DATA 5B,46,DE,77,73,6A,64
     ,15,76,7C,85,10,FA,64,46,3B
50   103 DATA 4A,58,46,D9,74,6A,7E
     ,6A,74,6A,64,65,64,7C,CB,77
3C   104 DATA 74,70,46,CB,4A,59,46
     ,08,12,F4,77,7E,7C,08,15,F4
7C   105 DATA 77,46,E6,4A,65,46,12
     ,F4,08,12,7C,15,F4,08,15,7C
BE   106 DATA CB,77,77,7F,46,FE,4A
     ,67,46,CB,77,74,74,7C,CD,08
3A   107 DATA 12,F4,76,E9,16,F7,74
     ,73,7E,E1,75,7E,46,80,4A,64
50   108 DATA 46,CD,16,F7,74,73,7E
     ,E1,75,74,46,98,4A,65,46,CD
22   109 DATA 65,6E,12,00,66,E9,66
     ,77,75,76,6F,F4,76,66,E1,66
8D   110 DATA 75,75,46,4D,4B,62,46
     ,08,16,F4,08,16,EC,77,7C,0B
B7   111 DATA 15,F4,08,16,7C,CD,08
     ,16,F5,70,72,E1,0B,62,6E,08
3C   112 DATA 16,6F,F4,81,6E,12,00
     ,6F,EC,08,62,7C,CF,75,75,46
7F   113 DATA 79,4B,63,46,DF,64,D7
     ,66,06,FA,12,09,09,66,0B,07
10   114 DATA 08,1F,66,00,0F,0A,03
     ,15,66,09,08,66,12,0E,03,66
D4   115 DATA 02,0F,15,0D,65,67,56
     ,04,FA,64,7C,CF,77,74,7E,46
BF   116 DATA 18,4B,60,46,15,F4,77
     ,7C,C7,0F,F4,76,E2,08,16,7C
62   117 DATA 00,77,62,6E,0F,6F,F4
     ,0B,62,6E,0F,6F,7C,C4,46,CB
5B   118 DATA 4B,61,46,DF,64,D7,66
     ,06,FA,15,09,14,12,66,02,0F
83   119 DATA 14,03,05,12,09,14,1F
     ,66,03,08,12,14,0F,03,15,66
C4   120 DATA 03,FA,1F,69,08,66,04
     ,FA,64,46,EF,4B,6E,46,E7,0D
04   121 DATA 62,7C,CD,0D,62,F5,F7
     ,64,1F,64,E9,0D,62,F5,F7,64
6A   122 DATA 08,64,E1,72,76,46,86
     ,4B,6F,46,CD,0D,62,F4,64,08
29   123 DATA 64,E1,0B,F4,0B,15,EC
     ,77,7C,CF,71,74,46,A9,4B,6C
F3   124 DATA 46,DF,64,D7,66,05,FA
     ,07,0A,16,0E,07,04,03,12,0F
A8   125 DATA 05,07,0A,69,0B,07,08
     ,13,07,0A,66,15,09,14,12,66
23   126 DATA 03,FA,07,69,0B,66,03
     ,FA,64,46,4D,4B,6D,46,E7,0D
24   127 DATA 62,7C,CD,0D,62,F5,F7
     ,64,07,64,E9,0D,62,F5,F7,64
FD   128 DATA 0B,64,E1,72,75,46,1E
     ,4B,6A,46,CD,0D,62,F4,64,07
05   129 DATA 64,E1,DF,64,D7,66,66
     ,16,0A,03,07,15,03,66,11,07
F3   130 DATA 0F,12,66,66,15,09,14
     ,12,66,14,09,13,12,0F,08,03
BA   131 DATA 66,0F,08,66,16,14,09
     ,05,03,15,15,66,64,7C,16,F4
F9   132 DATA 08,16,7C,CB,77,75,76
     ,7C,0B,F4,0B,15,EC,77,7C,CF
BA   133 DATA 71,74,46,C1,4B,6B,46
     ,DF,64,D7,66,03,FA,03,08,12
F0   134 DATA 03,14,66,0D,03,1F,04
     ,09,07,14,02,66,05,0E,07,14
7E   135 DATA 07,05,12,03,14,66,00
     ,09,14,66,0A,0F,08,03,67,66
C1   136 DATA 64,46,D4,4B,68,46,D1
     ,77,7F,7E,6A,76,46,E2,4B,69
EA   137 DATA 46,E7,0D,62,7C,CD,0D
     ,62,F4,64,64,E1,72,71,46,FF
C1   138 DATA 4B,76,46,CD,0D,62,F4
     ,81,6E,77,75,6F,E1,0D,62,F4
E9   139 DATA 64,85,64,46,B7,4B,77
     ,46,15,62,F4,64,64,7C,C7,1E
24   140 DATA F4,77,E2,77,70,7C,15
     ,62,F4,15,62,EC,0D,62,7C,C4
15   141 DATA 7C,15,62,F4,81,6E,77
     ,75,76,6F,EC,81,6E,77,7E,6F
31   142 DATA EC,81,6E,76,6F,EC,15
     ,62,EC,05,62,46,66,49,74,46
BA   143 DATA DF,64,D7,66,03,FA,13
     ,15,03,66,05,13,14,15,09,14
50   144 DATA 66,0D,03,1F,15,66,60
     ,66,14,03,12,13,14,08,66,12
4C   145 DATA 09,66,03,08,12,03,14
     ,67,66,64,46,7C,49,75,46,05
58   146 DATA F4,76,7C,02,F4,77,75
     ,7C,0F,F4,76,7C,0F,0F,F4,76
1F   147 DATA 7C,0B,F4,76,46,34,49
     ,72,46,DF,8E,6E,02,62,6A,77
E1   148 DATA 74,6F,64,DD,66,F6,86
     ,10,FA,F4,86,E8,F6,86,10,FA
5A   149 DATA E8,64,46,EC,49,73,46
     ,C7,1E,F4,76,E2,7E,7C,DF,64
CF   150 DATA 66,9B,66,10,FA,9B,66
     ,9B,9B,66,10,FA,9B,64,7C,C4
DB   151 DATA 46,9C,49,70,46,DF,64
     ,66,EB,86,10,FA,F7,86,FB,EB
16   152 DATA 86,10,FA,FB,43,64,46
     ,BC,49,71,46,CD,02,F4,74,77
E4   153 DATA E9,0B,15,ED,0F,0F,F4
     ,71,E1,05,F4,05,ED,77,7C,0F
50   154 DATA 0F,F4,0F,0F,ED,77,46
     ,60,56,7E,46,CD,0B,15,F5,F7
A2   155 DATA ED,77,E1,DF,8E,6E,02
     ,62,6A,77,75,EC,0F,6F,E0,74
05   156 DATA 6F,8C,6E,00,77,62,6E
     ,0F,EC,0F,0F,6F,6A,72,6A,77
6A   157 DATA 70,6F,46,7B,56,7F,46
     ,0F,F4,0F,EC,77,7C,CD,0F,F7
C2   158 DATA 7E,F6,0F,F7,0B,15,E1
     ,73,7F,46,03,56,7C,46,CF,73
A2   159 DATA 70,46,30,56,7D,46,CD
     ,0F,F5,7F,E9,0B,15,F5,F7,ED
01   160 DATA 77,E1,DF,E0,74,6F,64
     ,66,10,FA,64,7C,0F,F4,0F,EC
D8   161 DATA 77,7C,CF,73,7F,46,E4
     ,56,7A,46,CD,0B,15,F4,ED,77
EB   162 DATA E1,DF,8E,6E,02,62,6A
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      ,77,75,6F,E0,74,6F,64,66,10
88  163 DATA FA,5B,66,64,46,8E,56
      ,7B,46,CD,02,F7,77,74,E9,02
0D  164 DATA F5,74,74,E9,0B,15,F5
      ,F7,ED,77,E1,DF,8E,6E,02,62
A9  165 DATA 6A,02,6F,E0,77,7F,6F
      ,64,19,64,46,90,56,78,46,CD
DE  166 DATA 0B,15,F4,ED,77,E1,71
      ,77,46,40,57,79,46,E7,0D,62
0E  167 DATA 7C,CD,0D,62,F5,F7,64
      ,57,64,E9,0D,62,F5,F7,64,D7
75  168 DATA 64,E9,0D,62,F5,F7,81
      ,6E,77,75,6F,E9,0D,62,F5,F7
1B  169 DATA 81,6E,75,74,6F,E1,70
      ,75,46,79,57,06,46,CD,0D,62
C8  170 DATA F4,64,57,64,E9,02,F5
      ,74,77,E9,02,F5,0B,15,EC,77
4F  171 DATA 75,E1,DF,8E,6E,02,62
      ,6A,02,6F,E0,77,7F,6F,64,66
97  172 DATA 64,7C,05,F4,05,EC,77
      ,7C,02,F4,02,EC,77,7C,CF,70
C9  173 DATA 77,46,32,57,07,46,CD
      ,0D,62,F4,64,D7,64,E9,02,F7
04  174 DATA 77,75,E9,05,F7,76,E1
      ,DF,8E,6E,02,62,6A,02,6F,E0
B4  175 DATA 77,7F,6F,64,66,64,7C
      ,05,F4,05,ED,77,7C,02,F4,02
3E  176 DATA ED,77,7C,CF,70,77,46
      ,E6,57,04,46,CD,0D,62,F4,64
91  177 DATA 57,64,E9,02,F4,74,77
      ,E9,05,F5,0B,15,E1,05,F4,05
25  178 DATA EC,77,7C,0F,F4,76,7C
      ,0F,0F,F4,0F,0F,EC,77,7C,CF
CF  179 DATA 73,73,46,97,57,05,46
      ,CD,0D,62,F4,64,D7,64,E9,02
6A  180 DATA F4,77,75,E9,0F,0F,F7
      ,76,E9,05,F5,0B,15,E1,05,F4
E6  181 DATA 05,ED,77,7C,0F,F4,76
      ,7C,0F,0F,F4,0F,0F,ED,77,7C
90  182 DATA CF,73,73,46,AB,57,02
      ,46,CD,0D,62,F4,81,6E,77,75
A2  183 DATA 6F,E1,CB,77,75,73,7C
      ,CB,77,72,75,7C,CF,73,73,46
89  184 DATA 48,54,03,46,CD,0D,62
      ,F4,81,6E,75,74,6F,E1,0B,62
B7  185 DATA 6E,0B,6F,F4,15,62,7C
      ,CB,77,72,77,7C,CB,77,72,75
B3  186 DATA 46,50,54,00,46,CF,70
      ,77,46,62,54,01,46,DF,8E,6E
7B  187 DATA 02,62,6A,74,72,6F,46
      ,71,54,0E,46,0B,F4,0B,EC,77
A8  188 DATA 7C,CD,0B,F7,70,72,E1
      ,75,71,46,13,54,0F,46,C7,1E
51  189 DATA F4,0B,E2,74,EF,ED,77
      ,7C,0B,62,6E,1E,6F,F4,0B,62
57  190 DATA 6E,1E,ED,74,6F,7C,C4
      ,46,C3,54,0C,46,0B,13,62,F4
AC  191 DATA 81,6E,77,75,76,6F,EC
      ,81,6E,77,7E,6F,EC,81,6E,76
5D  192 DATA 6F,EC,64,0B,03,08,13
      ,E6,0C,FA,64,EC,05,62,46,DA
5E  193 DATA 54,0D,46,0B,62,6E,76
      ,6F,F4,0B,13,62,7C,0B,62,6E
6D  194 DATA 77,6F,F4,0A,62,46,8D
      ,54,0A,46,DF,64,D7,66,03,FA
DB  195 DATA 15,03,0A,03,05,12,66
      ,03,08,12,14,0F,03,15,66,00
83  196 DATA 09,14,66,0B,03,08,13
      ,66,66,0E,0F,12,66,07,66,0D
7B  197 DATA 03,1F,66,64,46,9B,54
      ,0B,46,CD,84,6E,77,7F,71,6F
47  198 DATA F4,70,72,E1,71,71,46
      ,4A,55,08,46,DF,64,D7,66,26
2A  199 DATA FA,64,46,6A,55,09,46
      ,1F,F4,77,7C,C7,1E,F4,74,E2
28  200 DATA 0B,7C,DF,64,D7,66,06
      ,FA,64,7D,1F,7D,64,7C,64,46
27  201 DATA 13,55,16,46,DF,64,D7
      ,64,7D,E0,77,77,6F,7D,8C,6E
05  202 DATA 0B,62,6E,1E,6F,6A,72
      ,6A,77,70,6F,64,66,03,FA,1F
60  203 DATA 69,08,66,05,FA,64,46
      ,37,55,17,46,E7,0D,62,7C,CD
20  204 DATA 0D,62,F5,F7,64,1F,64
      ,E9,0D,62,F5,F7,64,08,64,E1
BA  205 DATA 7E,77,46,D6,55,14,46
      ,CD,0D,62,F4,64,1F,64,E1,1F
81  206 DATA F4,1F,EC,77,7C,00,77
      ,62,6E,1F,6F,F4,0B,62,6E,1E
1F  207 DATA 6F,46,D0,55,15,46,C4
      ,46,97,55,12,46,CD,1F,F4,F7
9F  208 DATA 77,7E,E1,DF,64,D7,66
      ,08,FA,12,09,09,66,0B,07,08
96  209 DATA 1F,66,00,0F,0A,03,15
      ,66,0F,08,66,0B,03,08,13,66
90  210 DATA 67,66,06,FA,64,7C,CF
      ,77,74,7E,46,46,52,13,46,DF
CB  211 DATA 64,D7,66,08,FA,14,03
      ,6B,11,14,0F,12,0F,08,01,66
5C  212 DATA 08,03,11,66,02,0F,14
      ,03,05,12,09,14,1F,66,06,FA
B2  213 DATA 64,46,62,52,10,46,C7
      ,0F,F4,77,E2,77,7E,7C,DE,77
1F  214 DATA 73,6A,64,04,6B,00,64
      ,7D,76,7D,77,7E,7D,0F,7C,C4
D3  215 DATA 7C,CB,77,74,70,46,6A
      ,52,11,46,0F,F4,76,46,00,52
E5  216 DATA 1E,46,DE,77,73,6A,64
      ,04,6B,07,64,7D,76,7D,77,7E
C9  217 DATA 7D,15,7C,CB,77,74,70
      ,46,1B,52,1F,46,DE,77,73,6A
44  218 DATA 64,04,6B,16,64,7D,74
      ,7D,76,7C,CB,77,74,70,46,CB
DA  219 DATA 52,1C,46,15,15,F4,15
      ,7C,15,F4,15,EC,77,7C,12,F4
66  220 DATA 77,7E,7C,05,F4,0B,ED
      ,F3,6E,0F,EB,7E,6F,EA,7E,7C
61  221 DATA CD,05,F5,7E,E1,12,F4
      ,76,7C,15,F4,74,73,73,46,E4
B5  222 DATA 52,1D,46,07,62,F4,81
      ,6E,12,6F,EC,81,6E,15,6F,7C
E5  223 DATA 04,F4,76,46,8B,52,1A
      ,46,CD,0F,F5,F4,0B,E1,07,62
F1  224 DATA F4,07,62,EC,08,62,6E
      ,0F,6F,7C,0F,F4,0F,EC,77,7C
C2  225 DATA 04,F4,04,EC,77,7C,CD
      ,04,F5,F7,71,E1,7F,74,46,B3
E8  226 DATA 52,1B,46,CD,0F,F5,F4
      ,0B,E9,04,F4,71,E1,07,62,F4
84  227 DATA 07,62,EC,8C,6E,08,62
      ,6E,0F,6F,6A,77,6A,74,7F,6F
79  228 DATA 7C,0F,F4,0F,EC,77,46
      ,52,53,18,46,CD,85,6E,07,62
1A  229 DATA 6F,F5,F7,74,73,73,E1
      ,07,62,F4,07,62,EC,81,6E,76
96  230 DATA 6F,7C,CF,7F,72,46,78
      ,53,19,46,DE,74,6A,07,62,7D
4E  231 DATA 7C,DE,77,73,6A,64,13
      ,74,7C,64,7D,74,7D,76,7D,77
51  232 DATA 7E,7D,15,15,7C,CB,77
      ,74,70,7C,CD,12,E1,7E,7E,46
0F  233 DATA 16,53,26,46,DE,77,73
      ,6A,64,04,6B,16,64,7D,74,7D
54  234 DATA 76,46,33,53,27,46,DE
      ,77,73,6A,64,13,77,7C,64,7D
31  235 DATA 74,7D,76,7D,77,7E,7D
      ,77,7C,DE,77,73,6A,64,04,6B
13  236 DATA 16,64,7D,74,7D,72,46
      ,C3,53,24,46,DE,74,6A,81,6E
7D  237 DATA 15,15,EC,74,6F,7D,45
      ,E7,53,25,46,DE,77,73,6A,64
37  238 DATA 13,74,7C,64,7D,74,7D
      ,76,7D,77,7E,7D,77,7C,CB,77
D0  239 DATA 74,70,46,E8,53,22,46
      ,07,F4,76,7C,04,F4,76,46,9A
FA  240 DATA 53,23,46,DF,64,D7,66
      ,08,FA,15,09,14,12,0F,08,01
BD  241 DATA 66,03,08,12,14,0F,03
      ,15,66,00,09,14,66,08,03,08
A2  242 DATA 13,65,05,FA,64,46,4C
      ,50,20,46,08,16,F4,1F,ED,74
2B  243 DATA 7C,16,F4,08,16,7C,C7
      ,0F,F4,76,E2,08,16,7C,0B,62
96  244 DATA 6E,0F,5F,F4,00,77,52
      ,6E,0F,EC,74,6F,7C,C4,7C,CD
5E  245 DATA 77,75,75,46,78,50,21
      ,46,C7,0F,F4,76,E2,77,73,7C
22  246 DATA D1,08,0B,EC,07,EC,0F
      ,6A,80,6E,8C,6E,0B,62,6E,04
ED  247 DATA 6F,6A,0F,EC,72,6A,77
      ,6F,EC,81,6E,76,6F,6F,7C,C4
1B  248 DATA 7C,07,F4,07,EC,77,70
      ,46,12,50,2E,46,04,F4,04,EC
95  249 DATA 77,7C,CD,08,16,EC,77
      ,F7,04,E1,77,76,75,46,37,50
09  250 DATA 2F,46,D1,08,0B,EC,07
      ,6A,76,7C,07,F4,07,EC,77,7C
D9  251 DATA CD,07,F5,74,73,70,E1
      ,77,76,73,46,E6,50,2C,46,DF
DF  252 DATA 64,D7,66,06,FA,11,14
      ,0F,12,0F,08,01,66,0B,03,08
2C  253 DATA 13,66,15,14,09,01,14
      ,07,0B,66,12,09,66,02,0F,15
55  254 DATA 0D,66,04,FA,64,46,ED
      ,50,2D,46,15,F4,15,15,EC,74
3F  255 DATA 46,FB,50,2A,46,DE,77
      ,73,6A,64,04,6B,16,64,7D,74
68  256 DATA 7D,76,46,A9,50,2B,45
      ,0A,62,F4,81,6E,77,7E,6F,EC
71  257 DATA 81,6E,15,EC,77,6F,7C
      ,07,F4,7F,7F,7E,72,ED,07,02
9B  258 DATA 7C,CD,07,F5,74,73,72
      ,E1,0A,62,F4,81,6E,76,6F,EC
89  259 DATA 81,5E,07,6F,46,59,51
      ,28,46,07,62,F4,64,64,7C,C7
47  260 DATA 0F,F4,75,E2,74,73,75
      ,7C,07,62,F4,07,62,EC,81,6E
F0  261 DATA 84,6E,07,02,EC,0F,6F
      ,6F,7C,C4,7C,07,02,F4,07,02
E9  262 DATA EC,74,73,72,46,6A,51
      ,29,46,DE,74,6A,0A,62,07,62
7C  263 DATA 7D,46,05,51,36,46,DE
      ,77,73,6A,64,13,74,7C,64,7D
19  264 DATA 74,7D,76,7D,77,7E,7D
      ,15,46,1C,51,37,46,15,F4,15
44  265 DATA EC,77,7C,CD,07,02,F5
      ,7F,7F,7E,72,E1,77,76,7E,46
43  266 DATA CC,51,34,46,DF,64,D7
      ,66,66,16,14,09,05,03,15,15
EC  267 DATA 66,05,09,08,16,0A,03
      ,12,03,02,66,6B,66,07,08,09
F0  268 DATA 12,0E,03,14,66,02,0F
      ,15,0D,66,1F,69,08,66,64,45
DA  269 DATA DA,51,35,46,E6,74,7C
      ,E6,77,73,7C,D1,77,7F,7E,6A
78  270 DATA 76,46,FC,51,32,46,E7
      ,07,62,7C,CD,07,62,F5,F7,64
25  271 DATA 1F,64,E9,07,62,F5,F7
      ,64,08,64,E1,CF,77,77,70,46
AE  272 DATA 8F,51,33,46,CD,07,62
      ,F4,64,1F,64,E1,CC,77,46,92
68  273 DATA 51,30,46,D8,70,73,77
      ,74,70,46,AC,51,31,46,DE,77
3E  274 DATA 73,6A,54,13,77,7C,64
      ,7D,74,7D,76,7D,12,7D,15,46
28  275 DATA 45,5E,3E,45,E7,55,74
      ,6A,07,62,7C,08,12,F4,80,6E
65  275 DATA 07,62,EC,91,6E,75,6F
      ,6F,46,64,5E,3F,46,E7,65,74
FA  277 DATA 6A,07,62,7C,08,15,F4
      ,80,6E,07,62,EC,81,6E,76,6F
BA  278 DATA 6F,7C,15,F4,74,7C,C8
      ,46,72,5E,3C,46,DE,77,73,6A
D2  279 DATA 64,04,6B,16,54,7D,74
      ,7D,16,46,0B,5E,3D,46,E7,65
B3  280 DATA 74,6A,12,62,7C,12,00
      ,F4,80,6E,12,62,EC,81,6E,76
DB  281 DATA 6F,6F,46,11,5E,3A,46
      ,08,62,F4,64,64,46,CF,5E,3B
25  282 DATA 46,C7,0F,F4,76,E2,75
      ,76,7C,E7,65,74,6A,07,62,7C
7E  283 DATA 08,62,F4,08,62,EC,81
      ,6E,80,6E,07,62,EC,81,6E,76
DA  284 DATA 6F,03,FA,7C,C4,7C,16
      ,F4,16,EC,75,74,7C,CB,46,EF
22  285 DATA 5E,38,46,C2,77,73,6A
      ,03,77,62,6A,03,74,62,6A,03
FB  286 DATA 75,62,7C,CD,03,77,62
      ,F4,64,76,76,64,E1,CB,46,95
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4E  287 DATA 5E,39,46,DF,64,D7,66
    ,05,FA,02,0F,15,0D,56,03,14
EB  288 DATA 14,09,14,66,7C,66,64
    ,03,77,62,64,6A,64,03,74,62
C8  289 DATA 64,6A,64,03,75,62,46
    ,98,5E,C6,46,E6,74,7C,E6,77
66  290 DATA 73,46,B7,5E,C7,46,C7
    ,12,F4,77,E2,74,73,76,76,7C
22  291 DATA C4,7C,CC,77,46,4F,5F
    ,C4,46,00,F4,77,7C,C7,0F,F4
61  292 DATA 76,E2,16,7C,CD,00,F4
    ,76,E1,77,75,72,46,04,5F,C5
A3  293 DATA 46,00,F4,76,7C,16,F4
    ,16,ED,77,7C,C7,1C,F4,76,E2
61  294 DATA 16,7C,CD,8C,6E,0B,62
    ,6E,1C,6F,6A,72,6A,77,70,6F
55  295 DATA F5,F4,8C,6E,0B,62,6E
    ,1C,EC,77,6F,6A,72,6A,77,70
0F  296 DATA 6F,E1,77,75,75,46,2A
    ,5F,C2,46,07,62,F4,0B,62,6E
BD  297 DATA 1C,EC,77,6F,7C,0B,62
    ,6E,1C,EC,77,6F,F4,0B,62,6E
A2  298 DATA 1C,6F,7C,0B,62,6E,1C
    ,6F,F4,07,62,7C,00,F4,77,46
12  299 DATA 34,5F,C3,46,C4,46,3C
    ,5F,C0,46,C4,7C,C8,46,CD,5F
E2  300 DATA C1,46,0B,62,6E,0B,6F
    ,F4,00,77,62,6E,05,6F,46,F7
AE  301 DATA 5F,CE,46,CD,0B,F5,7F
    ,E1,DF,8E,6E,02,62,6A,77,75
CC  302 DATA EC,0B,6F,E0,74,74,6F
    ,8C,6E,0B,62,6E,0B,6F,6A,72
DC  303 DATA 6A,77,70,6F,46,F9,5F
    ,CF,46,0B,F4,0B,EC,77,7C,0F
9D  304 DATA F4,76,46,A1,5F,CC,46
    ,C7,1E,F4,05,E2,0B,15,ED,77
11  305 DATA 7C,00,77,62,6E,1E,6F
    ,F4,00,77,62,6E,1E,EC,77,6F
AB  306 DATA 7C,C4,7C,0B,15,F4,0B
    ,15,ED,77,46,56,5C,CD,46,CD
07  307 DATA 02,F7,0B,15,EC,77,75
    ,E1,DF,8E,6E,02,62,6A,02,6F
30  308 DATA E0,77,7F,6F,54,66,64
    ,7C,02,F4,02,ED,77,7C,05,F4
5D  309 DATA 05,ED,77,46,50,5C,CA
    ,46,CB,46,7A,5C,CB,46,CD,0B
77  310 DATA F5,7F,E1,DF,8E,6E,02
    ,62,6A,77,75,EC,0B,6F,E0,74.
C5  311 DATA 74,6F,8C,6E,0B,62,6E
    ,0B,6F,6A,72,6A,77,70,6F,46
0A  312 DATA 0E,5C,C8,46,0B,F4,0B
    ,EC,77,7C,C8,46,C4,5C,C9,46
A0  313 DATA CD,0B,F7,7F,E1,0B,0B
    ,F4,0B,0B,EC,77,7C,C7,1E,F4
54  314 DATA 76,E2,7E,7C,DF,8E,6E
    ,02,62,6A,77,75,EC,1E,6F,E0
BF  315 DATA 74,74,6F,8C,6E,0B,62
    ,6E,0B,0B,EC,1E,6F,6A,72,6A
A7  316 DATA 77,70,6F,7C,C4,46,CE
    ,5C,D6,46,C8,46,C8,5C,D7,46
51  317 DATA 7C,46,D2,5C,D4,46,7C
    ,46,FD,5C,D5,46,7C,22,FA,46
C4  318 DATA A4,5C,D2,46,7C,22,FA
    ,46,4F,5D,D3,46,7C,7C,66,1E
3C  319 DATA FA,7C,7C,46,68,5D,D0
    ,46,7C,7C,66,12,13,14,04,09
0A  320 DATA 66,0B,03,08,13,EB,02
    ,0F,14,03,05,E2,14,1F,66,15
82  321 DATA F6,12,03,14,66,65,7C
    ,7C,46,13,5D,D1,46,7C,7C,66
0B  322 DATA 1E,FA,7C,7C,46,3A,5D
    ,DE,46,7C,7C,66,6E,05,6F,77
73  323 DATA 7F,7E,70,66,05,FA,0A
    ,03,15,66,07,0A,0A,07,0B,66
79  324 DATA 08,FA,7C,7C,46,E4,5D
    ,DF,46,7C,7C,66,0D,FA,74,7E
DF  325 DATA 66,07,12,0D,0F,08,15
    ,D7,66,02,14,68,66,66,7C,7C
76  326 DATA 46,80,5D,DC,46,7C,7C
    ,66,0D,FA,E4,16,F6,12,66,0F
AE  327 DATA 11,66,07,FA,7C,7C,46
    ,AB,5D,DD,46,7C,7C,66,1E,FA
BC  328 DATA 7C,7C,46,52,5A,DA,46
    ,7C,22,FA,46,7D,5A,DB,46,7C
FC  329 DATA 22,FA,46,03,FA,EA,FF
    ,FA,EA,FF,FA,EA,FF,FA,EA,C6
63  330 DATA FA,47,4E,4C,4E,45,46
    ,D8,74,76,70,77,46,03,FA,0A
5D  331 DATA A6,4F,D5,43,12,13,14
    ,04,09,66,0B,03,08,13,56,10
6E  332 DATA 75,69,75,56,0C,FA,4B
    ,F1,0F,FA,66,0C,FA,4B,4B,05
4F  333 DATA 13,14,15,09,14,66,12
    ,09,66,15,03,0A,03,05,12,66
83  334 DATA 6B,56,14,03,12,13,14
    ,08,66,12,09,66,03,08,12,03
FA  335 DATA 14,66,05,FA,4B,4B,45
    ,4B,66,04,FA,64,52,46,4B,66
7A  336 DATA 56,6B,78,54,64,52,45
    ,03,FA,E4,B9,DC,9E,EF,69,C3
5E  337 DATA 46,EF,71,C3,47,EF,56
    ,E6,4E,66,D2,4F,EF,46,C3,B8
B5  338 DATA EF,4C,C3,59,EF,43,C3
    ,44,C3,45,EF,33,E6,4E,66,D2
31  339 DATA 4F,E6,46,F7,98,66,55
    ,66,94,B9,8E,86,56,96,82,A0
C3  340 DATA 45,E3,B8,5E,2F,55,C3
    ,B8,D6,A6,80,45,EF,B6,C3,B8
BF  341 DATA EF,42,C3,B9,EF,46,C3
    ,BA,EF,4C,C3,BB,E6,46,EF,6B
B6  342 DATA AC,AC,8E,D7,B8,8E,D7
    ,B8,8E,EF,78,D7,B8,8E,F7,B8
81  343 DATA 0F,C6,D7,B8,8E,86,52
    ,96,B3,66,A2,B9,8F,4B,86,22
C8  344 DATA 8F,57,B5,42,8F,D7,96
    ,B7,0E,E6,46,EF,66,D7,B8,8E
28  345 DATA D7,B8,8E,D7,B8,8E,D7
    ,B8,8E,AC,AC,F7,B8,0F,C6,D7
52  346 DATA B8,8E,86,52,96,B3,2E
    ,8F,D7,B6,5A,E3,44,B3,45,F6
D0  347 DATA 76,E3,BA,5E,2F,56,C3
    ,BA,E3,B8,5E,2F,6E,C3,B8,D6
E3  348 DATA 44,A0,B9,A0,44,96,5C
    ,E3,44,BF,43,B6,52,E3,BA,7E
CB  349 DATA AF,56,C3,BA,E3,B8,7E
    ,AF,6E,C3,B8,F6,44,80,B9,80
B6  350 DATA 44,0A,9D,4E,EF,56,E0
    ,EA,E2,BE,66,FB,B9,EF,46,E6
82  351 DATA 47,E4,4E,66,FC,B9,E4
    ,4B,FB,C0,4F,DE,66,44,8C,56
DA  352 DATA B1,66,FE,4F,5E,D6,67
    ,EF,45,66,93,B9,66,26,E0,66
B3  353 DATA C8,E0,0A,E8,E1,C3,5C
    ,C2,5D,E6,46,F7,5C,B6,40,66
80  354 DATA 94,B9,8E,96,B0,26,46
    ,46,E0,44,FB,AD,4F,CB,9E,67
21  355 DATA EF,46,C3,92,0A,66,44
    ,46,46,E4,46,FB,46,4D,DB,46
AC  356 DATA 42,FB,46,4A,DB,46,43
    ,FB,46,4B,DB,46,40,FB,46,48
3F  357 DATA DB,46,41,AE,96,A3,C8
    ,76,45,EF,42,CB,77,45,26,45
A3  358 DATA 46,EF,46,CB,66,96,EF
    ,46,CB,67,96,0A,CE,4E,46,FF
5A  359 DATA FA,46,14,FA,EF,4D,CB
    ,57,96,66,A7,43,AC,03,FA,B8
44  360 DATA 9E,43,96,4C,EF,E3,CB
    ,76,45,EF,B2,CB,77,45,0A,F3
6A  361 DATA 43,56,AA,41,AC,E2,F1
    ,96,44,5E,26,E0,FF,EF,26,C3
DA  362 DATA FF,66,93,65,EF,4E,66
    ,4F,AB,E3,FF,66,81,AB,66,55
CF  363 DATA A8,C3,E8,E3,D6,0C,0C
    ,F6,A7,EE,55,A8,C3,E9,CC,96
01  364 DATA 4E,E3,85,C3,E8,E3,82
    ,C3,E9,AC,EF,AF,E4,43,C3,E1
4C  365 DATA C0,EE,EF,46,E4,45,C3
    ,EF,C0,EC,EF,4E,66,4A,AB,EF
EF  366 DATA 29,65,FF,AB,EF,0B,66
    ,9B,AB,EF,6B,66,9B,AB,EF,11
B6  367 DATA 65,9B,AB,E5,46,E3,EF
    ,66,9B,AB,E3,EC,66,9B,AB,EF
C2  368 DATA 58,56,9B,AB,F7,E1,66
    ,9B,AB,8E,85,58,D6,B0,66,B8
AF  369 DATA AB,5E,E3,E1,2F,58,C3
    ,E1,D6,45,A0,EE,5E,E3,EF,E0
94  370 DATA EC,2F,58,C3,EF,D6,44
    ,A0,EC,A6,43,D6,EB,8F,46,D6
62  371 DATA EF,EF,4E,56,4A,AB,EF
    ,29,66,FF,AB,EF,0B,66,9B,AB
36  372 DATA EF,6B,66,9B,AB,EF,03
    ,66,9B,AB,EF,CD,66,9B,AB,EF
58  373 DATA 42,66,9B,AB,EF,4D,CB
    ,57,96,66,BD,AB,AC,AC,0A,8F
79  374 DATA 43,EF,4D,CB,46,9B,6A
    ,46,9B,56,BD,EF,45,CB,46,9B
F8  375 DATA E4,43,8C,AC,96,BA,E4
    ,42,EB,46,9B,6C,6C,20,F6,2C
3B  376 DATA 20,F6,AC,8C,96,B4,E3
    ,F6,0F,B9,26,66,AB,42,9F,B9
03  377 DATA B6,BE,E6,46,EF,4D,CB
    ,46,9B,6A,46,9B,56,BD,EF,46
09  378 DATA CB,46,9B,E4,41,8C,96
    ,BB,EB,46,9B,6C,6C,20,F6,2C
2E  379 DATA 20,F6,AC,AC,EB,46,9B
    ,6C,6C,20,F6,2C,20,F6,AC,AC
0E  380 DATA EB,46,9B,6C,6C,20,F6
    ,2C,20,F6,AC,AC,EB,46,9B,6C
54  381 DATA 6C,20,F6,2C,20,F6,E3
    ,F6,0F,B9,66,9F,43,8E,96,F2
5B  382 DATA 26,3E,EF,47,C3,E1,E6
    ,B9,66,51,43,86,B9,B6,06,E4
AA  383 DATA 44,E3,E1,B6,44,E4,42
    ,EB,46,45,96,41,A8,47,45,EB
2A  384 DATA 47,45,6A,EF,46,C3,EE
    ,FB,46,45,D7,E8,A0,E8,96,44
53  385 DATA A0,E9,AE,A2,EE,96,B6
    ,E4,46,C0,E1,EB,46,45,96,B0
D4  386 DATA EF,71,C3,47,EF,5D,CB
    ,57,96,EF,06,C3,D6,5E,26,EF
C6  387 DATA 71,C3,47,EF,5D,CB,57
    ,96,EF,06,C3,D6,26,66,2B,43
1D  388 DATA E0,E8,E2,E9,C0,6B,C2
    ,68,5E,0A,99,41,46,A8,66,96
55  389 DATA DF,46,45,26,46,EF,46
    ,CB,53,96,0A,5B,42,E3,46,6F
94  390 DATA 40,8F,44,B6,45,0A,D8
    ,BB,AC,EF,43,C3,4F,E4,1C,C0
92  391 DATA 0D,E4,46,EF,14,C3,62
    ,66,10,B3,16,B8,FE,EB,47,5A
61  392 DATA 83,62,B6,4F,80,0D,96
    ,A9,EF,4C,0A,2F,BF,16,B8,FE
F6  393 DATA EB,47,5A,D3,63,AE,A6
    ,41,96,B5,66,D1,B2,E3,50,03
46  394 DATA 51,03,5E,03,5F,03,5C
    ,B6,41,80,4F,96,86,0A,58,B2
EE  395 DATA E3,5E,83,40,B6,45,0A
    ,4D,B2,C3,64,EF,40,C3,77,0A
27  396 DATA 7A,42,E3,54,E0,55,C3
    ,50,C0,51,E3,40,C3,5E,E3,41
14  397 DATA C3,5F,EF,46,03,50,03
    ,51,03,5E,03,5F,C3,5C,66,72
8F  398 DATA BF,E4,1C,66,10,B3,E6
    ,46,16,B8,FE,EB,47,5A,9F,62
E8  399 DATA 46,B6,40,8C,96,AB,0A
    ,17,B3,8E,86,4E,96,AC,66,10
D9  400 DATA B3,16,B8,FE,EB,47,5A
    ,D7,76,8E,96,B3,E6,FC,16,B8
50  401 DATA FE,EB,47,5A,DF,46,47
    ,BE,96,B2,66,A6,BE,E3,7E,B3
E1  402 DATA 01,B6,45,0A,B0,B2,66
    ,AF,B3,83,7C,B6,45,0A,44,B3
CA  403 DATA E6,46,EF,13,66,14,42
    ,FF,46,40,C3,31,6A,46,5E,56
96  404 DATA BD,EF,56,CB,46,5E,6A
    ,46,5E,76,BD,E4,46,CC,20,31
96  405 DATA 6C,6C,20,31,6C,6C,CB
    ,46,5E,CC,20,31,6C,6C,20,31
EA  406 DATA 6C,6C,CB,46,5E,CC,20
    ,31,6C,6C,20,31,6C,6C,CB,46
3A  407 DATA 5E,CC,20,31,6C,6C,20
    ,31,6C,6C,CB,46,5E,E4,44,8C
EE  408 DATA 96,BB,EF,49,CB,46,5E
    ,8E,96,EB,AC,07,FA,EB,46,5A
BB  409 DATA 4F,4E,CB,46,5A,EB,46
    ,40,96,45,0A,DB,BB,83,5E,96
2B  410 DATA BF,C3,40,EB,47,40,C3
    ,41,0A,23,45,C3,31,6A,46,5E
3B  411 DATA 56,BD,EF,56,CB,46,5E
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Continued on page 109


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Repton 3

This month we take a long look at Superior Software's fascinating Repton 3.

By Marie Curry

Arcade action, strategy and games designer rolled into one. That's how you can sum up Repton 3 in one sentence.

The basic structure of the game is that of a maze which is chock-a-block with various hazards. In fact virtually everything is potentially dangerous, so watch out. Having said that, don't presume that this is merely another version of pacman. It's not even vaguely similar to that old and hackneyed favourite. The colourful graphics and intricate mazes are just a small part of the entertainment value of this game.

Once you've had a go at the first screen you will have the general idea. The most important objects on screen are the boulders. These block your path in many directions but you can move them about to make your way through the maze. However, they are often balanced very precariously and you will have to get the knack of which ones you can move without being flattened completely. For instance a boulder which is balanced on earth or on a barrier section will not move unless you push it, however a rock which is balanced on another rock or a diamond will slide off and if you're in the way that's the end of you.

When you start the first screen, my advice is to press 'M'. This will call up a map of the maze and you can work out your strategy. The problems which you face are many. If you grab the wrong diamond first then it could mean that there's no way that you can finish the screen as you may have dislodged a rock which blocks your path to some yet unclaimed gem.

The objectives of each screen are threefold. You must collect all the diamonds collect the golden crown and kill all the monsters. This gives you quite a lot to think about but no matter how difficult it is there is always a solution, at least so Superior Software claims, although a great amount of lateral thinking is required to sort some of the messes out.

The hazards (other than falling boulders) come in many guises. The monsters, and very sinister looking they are too, hatch out of eggs and chase you remorselessly until you squash them with a rock. There is no way that you can avoid hatching the eggs since there are always diamonds which you need that are supporting them. You need to think ahead and spy out a convenient boulder to use when they come at you on the rampage.

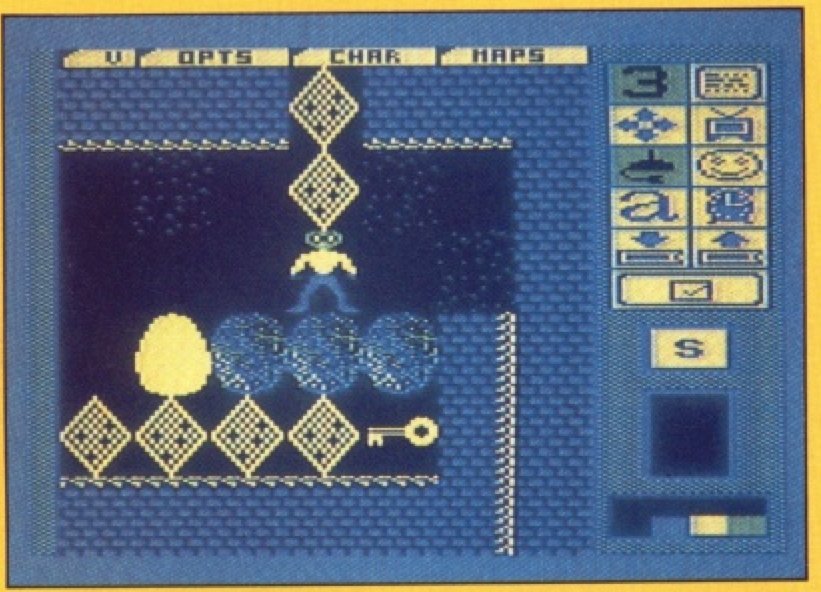
There are also spirits, which are deadly, however these must be put in cages. The trick here is to clear the path to the cages so that when you let the spirits out they'll make a bee line for imprisonment. As soon as they get into the cages they turn into diamonds and you're laughing. If you try and squash a spirit then you only stun it and it gets a bit bewildered for a while.

You may think that if you've got a map to study, and can work out exactly what your strategy will be per screen then there's no tension in the game. However there is a time limit on each screen and sometimes, especially if you're a novice feeling your way, this is hopelessly inadequate. To aid you in your race against the clock there are time-capsules which you can pick up which add invaluable seconds to your deadline.

Remember that when you've collected the diamonds and crown and killed all the monsters, you must find the time bomb and defuse it (this is only a matter of passing over it).







Skulls are also deadly but at least they don't chase you and keys will open safes to reveal yet more diamonds. On at least one screen the timing of the opening of the safes is all important so beware. You must always look ahead to the consequences of your actions. A bit like chess but rather more light hearted.

A very important factor on some screens are the transporters. Some screens are divided into several sections and the only way to compete them is by whizzing around in transporters. However, each transporter can only be used once, so that in most cases, there's no going back. If you enter the transporter too soon, e.g. before you've killed a monster or got all the treasure then you'll find that you cannot complete the screen, so once more there's a lot of forethought involved.

There are 24 levels in all, each getting progressively more difficult. These are divided into three sections of eight. One of the best features about this game is that when you finish a screen you are given a password so that you can return to it whenever you like, saving you the boredom of completing the same screens over and over again every time you want to play the game.

A character designer and screen designer are also included so that you can create mazes for yourself if you get bored with the ones supplied on the original version. This gives another fascinating dimension to the game along with the possibility of infinite variations.

All in all this game has so many attractions that it cannot be too highly recommended. It's totally addictive and there is enough variation to suit several different kinds of games players. Superior Software lives up to its name. YC

Touchline
Title: *Repton 3.* ***Supplier:*** *Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX.* ***Machine:*** *C64.* ***Price:*** *£9.95 cassette, £11.95 disk.*
Originality: *7/10.* ***Playability:*** *10/10.* ***Graphics:*** *8/10.* ***Value:*** *10/10.*

Word-Pro Add-On

Many Plus/4 owners find the built in word processor inadequate. Here, we bring you a program which will vastly improve the quality of the hard copy you can generate

By William Sellers

The Plus/4 is now available at a very reasonable price as a word processing package, with a disk drive and MPS803 printer. The built in software has been widely criticised, but, in fact the printer is probably the weakest link.

It has a rather unattractive character set which, due to economies on the printing head, only uses 7*5 dots per character which does not allow it to produce true descenders and so letters such as g and y are particularly ugly. This problem can be overcome by redefining these letters and using the graphics mode so that the descending parts can be printed on the line below. The improvement is really quite impressive.

The software itself is also not very well matched to the printer, and does not take full advantage of the printer facilities since the justification is performed on a whole character space resolution whereas the printer allows dot precision to be used for spacing. This allows a much more even layout to be achieved with all the gaps appearing exactly the same size. There is also no software underline function, but this can easily be implemented in association with the descenders.

How It Works

The program works by intercepting the character output to the printer and stores a whole line which it can then reorganise if justification is required. The modified line is then printed character by character, replacing the redefined letters and removing control codes.

After a graphic mode linefeed, the line is then printed again, this time taking care of the descenders and the underlining. Normally, such output redirection is achieved by changing the output vector at $0324. Unfortunately, this general output routine is not called for printer output in this instance and the specific serial bus output routine is used which does not have a RAM vector. Thus the only way to redirect output is to find the output call in the inbuilt software and change it to jump to the new routine.

This would not, of course, be possible if the program ran in ROM but in fact the Plus/4 built in software merely loads itself from ROM into RAM and once here can be altered. To do this, the subroutine call needs to be changed after the program has been moved to RAM otherwise the change will be overwritten. This can be done by changing the output vector to point to a short routine in the cassette buffer so that when the copyright message is printed, the program jumps to this routine which changes the required subroutine call and then resets the vector before returning to the main program. Now, when printer output is performed, the program jumps to the new output routine as required.

In Use

Type in the Basic loader, save a copy, reset the computer, load it again and run it. After an initial wait while the machine code programs are POKEd into place, the built in software is entered in the normal fashion except that the copyright message has been altered. The word processor can now be used completely normally since the program is stored in an area of memory that appears to be unused. All normal word processing commands can be used, though the effect of printer control codes on the user defined characters are uncertain so that the ASC command should be avoided.

It was decided that the reverse graphics facility was not very useful but that the double width characters were needed for titles. Thus, they can be switched on by a <C=> <*> character inserted into the text (not in reverse graphics) and off by a <SHIFT> <—>. Similarly the software underlining is switched on by <SHIFT> <+> and off by the <SHIFT> <—> again.

The software underlining can be used anywhere, even for single letters within a word. Double width control is similar but it is not permitted in lines that are justified since there is no facility to correct for the double width characters. Double width is also switched off by a carriage return but the underline needs to be switched off specifically. If active, whole series of documents and also page numbers can be underlined.

All printing is performed with graphic mode linefeeds. Since two line are printed per line of text the line spacing is 36 lines per seven inches so

that for standard sized paper the PAGEPAUSE mode will be needed to allow the paper to be lined up properly again. Also, by having to do twice as much printing, and by having user defined characters which disables the bidirectional printing, the printing speed is considerably reduced. It is suggested that draft versions be produced without the add on program which can be reserved for the final draft. The control characters will be printed in the normal mode and so these facilities can be checked.

The Program

Lines 10040-10410 – This is the routine that resides in the cassette buffer ($0333-03F2) which is called by the first output from the in built software. It resets the output vector to its normal value of $EC4B and changes the subroutine call at $3B50 to JSR $7000 so that the new output routine is used. It also changes the copyright message to indicate that the modified version is in use.

Lines 10450-10880 – are the main output routine. This starts at $7000 which is free when the word processor is being used. It first checks that the output is for the printer rather than the disk drive by looking for the device number at $AE. It then stores the characters in a buffer at $7900 until a carriage return is detected. When this happens, its position from the start of the line is checked with respect to the right margin which is stored at $7E73. If they are equal then the line may need rejustifying and the justify routine is called. Then the true descender output routine is called to print the buffer contents. The registers are reset to their calling value before returning to the main program.

Lines 10900-11950 – perform the necessary line reorganisation required for the improved justification. This first of all finds the line length and the left margin. It then counts the number of non-space and non-control characters, and the number of gaps between words. This information is used to calculate the ideal gap size. First of all the difference between the linelength and the number of characters is divided by the number of gaps. The result is the number of whole character spaces between each word. The remainder is multiplied by six and then divided by the number of gaps again. The result is the number of additional dot spacings between words and the remainder is the number of gaps to have an extra dot. To insert the correct gaps between words, the words are copied one by one to a second buffer at $7A00 and the correct gap inserted between by the insert gap subroutine. The second buffer is then copied back to the first before returning to the main output routine.

Lines 11970-12210 – insert the required gap, as predicted by the calculations performed by the calling routine, into the line copy in the second buffer.

Lines 12390-12740 – These are an eight bit integar multiply and divide routine. These can only handle numbers up to 255 but, because of this limitation, are very much quicker than the Basic arithmatic routines. This means that the rejustification can be performed with no noticeable delay.

Lines 12760-13820 – perform the true descender output. This requires the printer head to make two pases of the output buffer the first to print the normal letters and the top halves of those that descend; the second to print the descenders and any underlines. Both pases are performed in the same way: letter by letter; checking, for control characters, spaces and redefined characters. The lower case k is also redefined so the character lookup for the upper line is different to that for the lower line. UL is used as a flag to check whether underlining is active or not. This does not effect the upper pass, but is important for all non-blank characters in the second pass, if UL is zero, underlining is not performed. EF is a similar flag for double width mode – this is only needed for the user defined characters since the other double width control is intrinsic to the printer.

Lines 13840-13940 – are used to output bytes in bit map mode – it is used for the single dot space character and the carriage returns at the end of the line.

Lines 13960-14210 – These are the lookup routines to see whether a character needs to be redefined. If the character is not found the Y register returns zero, otherwise the position number in the character list is returned.

Lines 14230-14510 – use the information from the lookup tables to find the correct character data and then output the user defined character.

Lines 14530-15200 – store the new character information in the standard seven dot + 128 format used by Commodore printers. Thus, these characters can easily be changed if a different design is preferred.

Lines 14710-14820 – This is a short routine that controls underline and double width for the user defined characters. • YC

```
PROGRAM: PLUS3-PLUS

READY.

10 REM PLUS3-PLUS
20 REM <C> WILLIAM SELLERS 1986
30 REM RESET COMPUTER, LOAD & RU
N
40 POKE55,255:POKE56,111:CLR
50 PRINT"[CLEAR]PLEASE WAIT.....
."
60 D=819:L=150
70 T=0
80 FORX=1TO8
90 READA:IFA=-1THEN140
100 POKED,A:D=D+1:T=T+A
110 NEXT
120 READA:IFA=-1THEN140:ELSEIFT<
>ATHENPRINT"ERROR IN LINE ";L:EN
D
130 L=L+10:GOTO70
140 IFD<>923+1THENPRINT"ADDRESS
ERROR":END
150 DATA72,138,72,169,75,141,36,
3,706
160 DATA169,236,141,37,3,169,0,1
41,896
170 DATA94,59,169,112,141,95,59,
162,891
180 DATA0,169,32,157,162,51,232,
224,1027
190 DATA167,208,248,162,0,189,10
6,3,1083
200 DATA240,7,157,162,51,232,76,
88,1013
210 DATA3,104,170,104,76,210,255
,32,954
220 DATA32,32,32,80,76,85,83,51,
471
230 DATA45,77,79,68,32,86,49,46,
482
240 DATA48,13,13,13,32,32,32,32,
215
250 DATA60,67,62,32,49,57,56,54,
437
260 DATA32,87,73,76,76,73,65,77,
559
270 DATA32,83,69,76,76,69,82,83,
570
280 DATA0,-1
```

```
290 D=28672:L=380
300 T=0
310 FORX=1TO8
320 READA:IFA=-1THEN370
330 POKED,A:D=D+1:T=T+A
340 NEXT
350 READA:IFA=-1THEN370:ELSEIFT<
>ATHENPRINT"ERROR IN LINE ";L:EN
D
360 L=L+10:GOTO300
370 IFD<>29558+1THENPRINT"ADDRES
S ERROR":END
380 DATA8,142,102,113,140,103,11
3,141,862
390 DATA104,113,166,174,224,4,24
0,6,1031
400 DATA32,168,255,76,42,112,201
,192,1078
410 DATA144,3,56,233,96,174,105,
113,924
420 DATA157,0,121,238,105,113,20
1,13,948
430 DATA240,11,174,102,113,172,1
03,113,1028
440 DATA173,104,113,40,96,169,0,
141,836
450 DATA114,113,173,115,126,205,
105,113,1064
460 DATA208,8,169,1,141,114,113,
32,786
470 DATA85,112,32,171,113,169,0,
141,823
480 DATA105,113,76,42,112,162,0,
189,799
490 DATA0,121,232,201,32,240,248
,202,1276
500 DATA142,106,113,173,105,113,
56,237,1045
510 DATA106,113,141,108,113,169,
0,141,891
520 DATA109,113,174,106,113,189,
0,121,925
530 DATA201,33,144,7,201,123,176
,3,888
540 DATA238,109,113,232,201,13,2
08,237,1351
550 DATA169,0,141,110,113,168,17
4,106,981
560 DATA113,189,0,121,232,201,32
,240,1128
570 DATA9,160,0,201,13,208,242,7
6,909
580 DATA174,112,192,1,240,235,23
8,110,1302
590 DATA113,160,1,76,145,112,173
,108,888
600 DATA113,56,237,109,113,141,1
69,113,1051
610 DATA173,110,113,141,170,113,
32,143,995
620 DATA113,173,169,113,141,111,
113,173,1106
630 DATA170,113,141,141,113,169,
6,141,994
640 DATA142,113,32,115,113,173,1
41,113,942
650 DATA141,169,113,173,110,113,
141,170,1130
660 DATA113,32,143,113,173,169,1
13,141,997
670 DATA112,113,173,170,113,141,
113,113,1048
680 DATA162,0,160,0,189,0,121,20
1,833
690 DATA32,208,8,153,0,122,232,2
00,955
700 DATA76,244,112,189,0,121,201
,32,975
710 DATA240,12,201,13,153,0,122,
240,981
720 DATA19,232,200,76,3,113,32,5
3,728
730 DATA113,232,189,0,121,201,32
,240,1128
740 DATA248,76,3,113,153,0,122,1
62,877
750 DATA0,189,0,122,157,0,121,23
2,821
760 DATA201,13,208,245,96,142,10
7,113,1125
770 DATA174,111,113,240,9,169,32
,153,1001
780 DATA0,122,200,202,208,249,17
4,112,1267
790 DATA113,240,9,169,128,153,0,
122,934
800 DATA200,202,208,249,173,113,
113,240,1498
810 DATA9,206,113,113,169,128,15
3,0,891
820 DATA122,200,174,107,113,96,0
,0,812
830 DATA0,0,0,0,0,0,0,0,0
840 DATA0,0,0,160,8,169,0,10,347
850 DATA46,142,113,144,9,24,109,
141,728
860 DATA113,144,3,238,142,113,13
6,208,1097
870 DATA238,141,141,113,96,0,0,1
60,889
880 DATA8,169,0,14,169,113,42,20
5,720
890 DATA170,113,144,6,237,170,11
3,238,1191
900 DATA169,113,136,208,238,141,
170,113,1288
910 DATA96,0,0,162,0,189,0,121,5
68
920 DATA232,201,123,240,248,201,
125,208,1578
930 DATA13,169,15,32,168,255,169
,0,821
940 DATA141,156,114,76,173,113,2
01,127,1101
950 DATA208,16,173,114,113,208,2
22,169,1223
960 DATA14,32,168,255,141,156,11
4,76,956
970 DATA173,113,201,13,240,30,32
,178,980
980 DATA114,192,0,208,11,201,128
,208,1062
990 DATA13,168,32,158,114,76,173
,113,847
1000 DATA32,220,114,76,173,113,3
2,168,928
1010 DATA255,76,173,113,168,32,1
58,114,1089
1020 DATA162,0,142,157,114,189,0
,121,885
1030 DATA232,201,32,240,3,141,15
7,114,1120
1040 DATA201,13,208,5,168,32,158
,114,899
1050 DATA96,201,123,208,8,169,1,
141,947
1060 DATA155,114,76,5,114,201,12
5,208,998
1070 DATA16,169,0,141,155,114,14
1,156,892
1080 DATA114,169,15,32,168,255,7
6,5,834
1090 DATA114,201,127,208,16,173,
114,113,1066
1100 DATA208,195,169,14,32,168,2
55,141,1182
1110 DATA156,114,76,5,114,201,12
8,208,1002
1120 DATA21,173,155,114,208,8,16
0,128,967
1130 DATA32,158,114,76,5,114,160
,136,795
1140 DATA32,158,114,76,5,114,201
,32,732
1150 DATA176,6,32,168,255,76,5,1
14,832
1160 DATA201,129,176,246,32,196,
114,192,1286
1170 DATA0,240,6,32,220,114,76,5
,693
1180 DATA114,173,157,114,240,5,1
73,155,1131
1190 DATA114,208,8,169,32,32,168
,255,986
1200 DATA76,5,114,169,96,32,168,
255,915
1210 DATA76,5,114,0,0,0,169,8,37
2
1220 DATA32,168,255,152,32,168,2
55,169,1231
1230 DATA15,32,168,255,169,0,141
,156,936
1240 DATA114,96,160,6,217,189,11
4,240,1136
1250 DATA3,136,208,248,96,42,71,
74,878
1260 DATA75,80,81,89,160,5,217,2
14,921
1270 DATA114,240,4,136,208,248,9
6,200,1246
1280 DATA200,200,200,200,200,96,
42,71,1209
1290 DATA74,80,81,89,142,107,113
,136,822
1300 DATA140,26,115,140,141,113,
169,5,849
1310 DATA141,142,113,32,115,113,
172,141,969
1320 DATA113,162,5,169,8,32,168,
255,912
1330 DATA185,27,115,200,32,82,11
5,202,958
1340 DATA208,246,169,128,32,82,1
15,169,1149
1350 DATA15,32,168,255,173,156,1
14,240,1153
1360 DATA5.169,14.32,168,255.174
,107,924
1370 DATA113,96,0,184,196,196,19
6,248,1229
1380 DATA128,128,128,253,128,255
,144,144,1308
1390 DATA168,196,252,196,196,196
,184,184,1572
1400 DATA196,196,196,252,188,192
,192,192,1604
1410 DATA252,128,130,130,130,129
,129,130,1158
1420 DATA130,129,128,131,128,129
,128,128,1030
1430 DATA128,128,128,128,131,128
,130,130,1031
1440 DATA130,129,72,173,26,115,2
01,6,852
1450 DATA176,4,104,76,102,115,17
3,155,905
1460 DATA114,240,247,104,9,136,7
2,173,1095
1470 DATA156,114,208,4,104,76,16
8,255,1085
1480 DATA104,32,168,255,76,168,2
55,-1
1490 POKE804,51:POKE805,3
1500 SYS1525: 3-PLUS-1
```

YC

Games Reviews

For those hours when you really need to relax, then perhaps a shot of adrenalin from a few of these new releases will pep you up.

HEART OF AFRICA

Hiram Perkins Primm was an eccentric millionaire. Eccentric because he had an obsessive love for Africa – the dark continent – as well as several theories not universally acknowledged by so called experts. Was – because he has disappeared on one of his many expeditions and is now presumed dead.

How you came to be involved in all this is an interesting story. Because his family showed no interest whatsoever in Hiram's quest for the legendary tomb of Ahnk Ahnk, he promptly cut them all out of his will and specified that none of them should receive a penny. Instead, his money was to go to a suitable candidate who would use the opportunity to shed light on to the dark continent, who knew nothing about Africa, was prepared to go alone and who could complete the task within five years.

Thus it is that you find youself in Cairo in January, 1890,



equipped with nothing and with only $250 in your pocket. From the notes of Mr Primm that you have been able to trace, it seems that your journey will take you the length and breadth of Africa as you search for clues that, hopefully, will lead you to the tomb of Ahnk Ahnk. The game is primarily one of exploration. You wander around looking for treasure and information, making sure that at all times, you have sufficient supplies for the next stage of your journey.

Wandering into a town or village changes the view as a large scale map of your immediate surroundings. Bumping into a passing native whilst holding a gift is likely to get you a map of the huts. Some of these can be entered and you can buy or sell various items. Give an appropriate gift to a village chieftain and he will reward you with clues, all of which can be recorded in your diary. Only the big cities will be able to sell such 'luxury items' as canoes, shovels or guns. There are also pubs for saving your current position.

Controlling the game is very simple. You can move your character anywhere on the huge scrolling map providing that you keep to the limits of the terrain. Pressing the fire button allows you to access one of four icons. The diary contains all your clues and is very well presented. Options is used to get status reports – where am I and how am I – as well as letting you bury a supply of items for future use. The hand icon lets you juggle items between hand and backpack and the compass allows you to examine the map.

Heart of Africa is a strange type of game. A bit of strategy, a bit of problem solving and a lot of exploring. Graphically, it is quite crude and the combination of these factors and the fact that the game is only available on disk mean that it will have limited appeal. This is a pity because the game itself is really quite good and if you fancy yourself as a latter day Dr Livingstone, is well worth investigating.

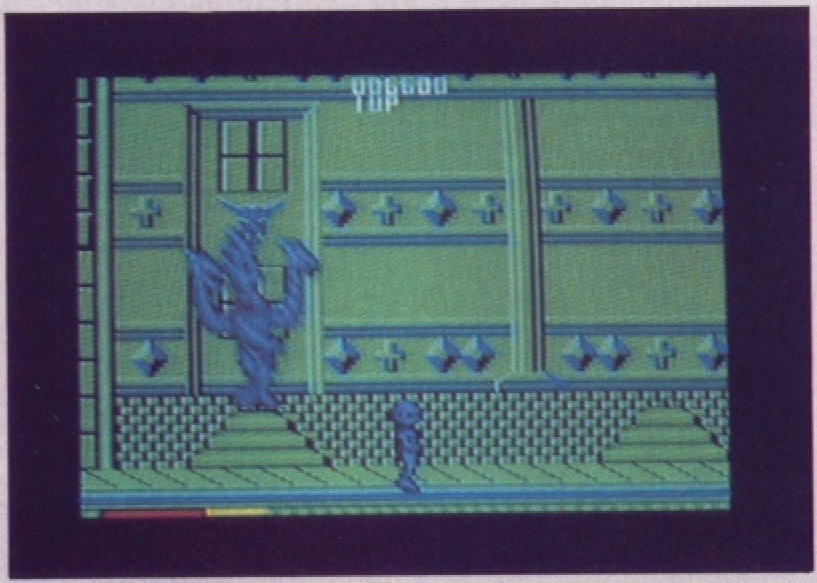
G.R.H.

Touchline

Title: *Heart of Africa.* ***Supplier:*** *Ariolasoft, 68 Long Acre, London WC2E 9JH.* ***Tel:*** *01 836 3411.* ***Machine*** *C64.* ***Price:*** *£14.95.*
Originality: *7/10.* ***Graphics:*** *5/10.* ***Playability:*** *8/10:* ***Value:*** *7/10.*

GALVAN

Evil reigns on the planet Cynep and the Cosmo Police have been trying to stamp it out for many a long year. Their efforts have not been enough though and slowly, they have been eliminated until now, you are the only surviving



member of that force. Can you succeed where all the rest have failed?

To make the plot even more ludicrous, you go into the Techno Caverns unarmed save for a hefty punch. This however only works against some of the creatures so finding a source of weaponry is of paramount importance. Fortunately, there just happen to be a series of power pyramids scattered around the caves. Collecting these will increase both your own power and give you extra firepower in increasing stages. The first pyramid gives you a suit of armour and a gun, the second an arc blaster and the third a white bolt neutraliser although these last two weapons only last for a short period of time. Losing a life reduces you to punching your way out of trouble again. Extra pyramids can also be gained by killing a blue meanie with either fist or gun. At the bottom of each level is a multi headed demon. Each of the heads must be destroyed in turn by jumping up and shooting in mid leap. All this as you also attempt to avoid the lethal lazer bolts the heads are spitting at you.

Graphically, the game is only average and that term can be used to describe Galvan as a whole. Has anyone succeeded in destroying the evil? No-one knows but my guess is that they all died of boredom rather than at the hands of the demons.

G.R.H.

Touchline

Title: *Galvan.* ***Supplier:*** *Imagine, 6 Central Street, Manchester M2 5NS.* ***Tel:*** *061 832 6633.* ***Machine:*** *C64.* ***Price:*** *£8.95.* ***Originality:*** *5/10.* ***Graphics:*** *6/10.* ***Playability:*** *7/10.* ***Value:*** *4/10.*

AMERICA'S CUP

The America's Cup is one of the most exclusive sports only fully appreciated by those who know the difference between light genoa's and spinnakers, gybes and tacks. Now the sailing crew have a computer game.

The rest of the world only discovered the America's Cup when the Americans were finally beaten after holding the trophy for over 100 years.

At the time of writing we might even stand a chance through our boat White Crusader!

Now you can win this elusive trophy without getting your hulls wet.

Sailing is quite a complex process particularly when the wind is blowing in completely the wrong direction. To make things worse the America's Cup course is designed so this happens most of the time!

The secret appears to be in your initial sail selection and when you change them during the race.

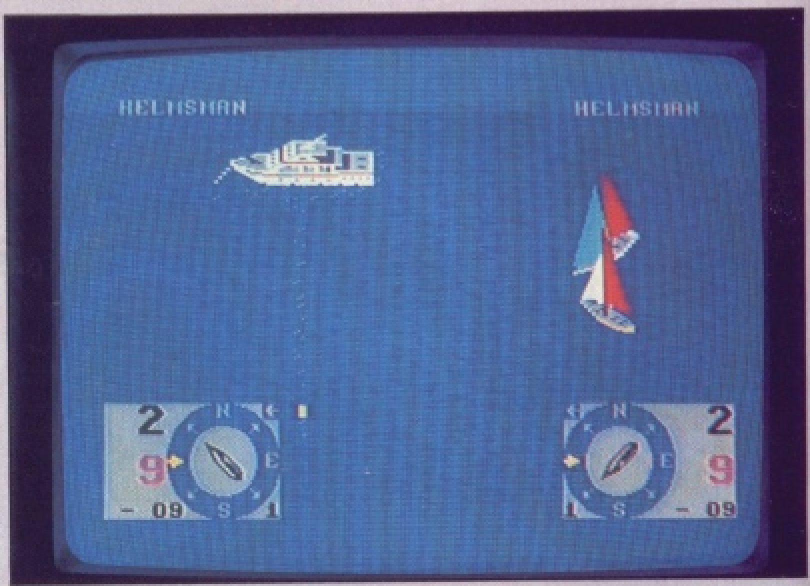
This will be beyond most beginners and will only make sense after digesting the reams of sailing theory that accompany the game.

Perhaps then you will be able to take on the Defender in a seven race series. To make things worse you're not even allowed to ram your opponent!

Once you've mastered the controls and begun to put the theory into practice then the games mechanics and screens that pilot the route and relative positions on the course begin to make sense. Unless you're a yachting enthusiast or are prepared to learn then give this one a miss. **T.H.**

Touchline

Name: *America's Cup.* ***Company:*** *US Gold, Units 2/3, Holdord Way, Holford, Birmingham, B6 7AX.* ***Price:*** *£9.99.* ***Machine:*** *C64.*
Originality: *9/10.* ***Graphics:*** *6/10.* ***Playability:*** *4/10.* ***Value:*** *6/10.*



CRYSTAL CASTLES

Whereas Yogi Bear has a distinct preference for picnic hampers and Winnie the Pooh likes nothing better than getting stuck into a pot of hunney, Bentley Bear has decided that there are more important things in life than his stomach. He collects diamonds. And rubies. And sapphires. In fact BB collects any gem he can lay his paws on. Luckily for him, there just happen to be a whole series of plateaux just teeming with goodies if only he can avoid the protecting nasties.

After all the hype surrounding this game including such quotes as 'knocked me off my feet' and 'beyond description', I was expecting something pretty sensational. What did we

get? 3D Pacman! Yes, you can run round assorted mazes collecting power pills, sorry diamonds, whilst avoiding pursuing nasties. OK, so there are extra touches such as lifts and secret passages and so on but not enough to make the game in any way outstanding. There are a variety of nasties to avoid – mad marbles, skeletons, tree spirits and bees. Some can be leapt over rendering temporary paralysis and



there are magic hats which make you invincible – for a short while. These and the bonus honey pots should be collected carefully though as the nasties cannot get past them whilst they are blocking the path. There are four different skill levels to choose from (all they do is speed up the action) and the levels must be played in turn. At least on the multiload cassette, you can ply the sets of six levels in different orders.

Although the arcade version may have been stunning, the 64 version is graphically very poor indeed with wishy washy colours and indistinct sprites. The game does have a certain element of 'just one more go' about it but the overall effect is one of huge disappointment.

G.R.H.

Touchline

Title: Crystal Castles. ***Supplier:*** *US Gold, Units 2/3, Holford Way, Holford, Birmingham B6 7AX.* ***Tel:*** *021 356 3388.* ***Machine:*** *C64.* ***Price:*** *£9.95.*
Originality: *5/10.* ***Graphics:*** *5/10.* ***Playability:*** *7/10.* ***Value:*** *6/10.*

JUDGE DREDD

Here, at last, is your chance to patrol Mega City One as the, one and only, Judge Dredd.

Your job is to cruise the city on your "Iawmaster" motorbike looking for perps that need justice.

Crime reports flash up on your map warning that muggings, robberies, murders, alien seed deals and stookie glandings are in progress and you must rush to the scene to arrest the culprit.

The scene of the crime is always part of the sprawling streets of Mega City One.

In the game these are presented by screens of platforms, doors, lifts, rats and dubious looking people of such delightful areas as the Norman Tebbit Block, Sump Industries and the swamp.

Arresting Judge Dredd style means beating the Perp into a pulp or blasting him away if he "doesn't come quietly".

Some perps of the lesser crimes such as mugging may stop if you tell them to or perhaps fire a warning shot. However the hardened criminals such as murderers, tobacco smokers and stookie glanders will shoot it out with you.

The well equipped Judge about town has six types of bullet designed to take out the most persistent perp. Normal, high explosive, and incendiary stop anything in their path, heat seeking bullets are useful for shooting around corners as are riccohet bullets but care must be taken not to shoot yourself! Finally armour piercing bullets allow you to fire through the platforms.

Each building is divided into levels and so from the crime report you can track down the perp. Once you've arrested him (gunned him down) you're returned to the patrol screen where you must rush to the next crime.

You have to be quick as crime reports constantly come through. If there's more than eight the city is swamped in crime and your game ends.

The game captures the spirit of crime fighting in the future although it has strayed from the 2000AD Judge Dredd character which will no doubt annoy comic connoisseurs. The rest of us will enjoy it.

Touchline

Name: *Judge Dredd.* ***Company:*** *Melbourne House, 60 High Street, Hampton Wick, Kingston-Upon-Thames, Surrey KT1 4DB.* ***Tel:*** *01 943 3911.* ***Machine:*** *C64.* ***Price:*** *£9.95.*
Originality: *6/10.* ***Graphics:*** *9/10.* ***Playability:*** *8/10.* ***Value:*** *8/10.*



WORLD GAMES

Following on from the success of Summer and Winter Games, World Games gives you the chance to try your skill at eight more assorted events. And a stranger mix of competitive sports, you could not hope to meet anywhere else. Six of the events are limited to the country of origin whilst only two have a more widespread appeal.



First stop is Russia, a country that has dominated weightlifting, especially at super heavyweight levels for some years now. You must compete in both the snatch and clean and jerk. Timing the various elements of the lifts is the key to success here and there is also considerable psychological strategy in selecting which weights to attempt to give you maximum success and put your opponents under maximum pressure.

Barrel jumping from Germany is the second event. Co-ordinate the movements of your skater to gain maximum speed and then time your leap in order to clear the chosen number of barrels. Cliff diving is Mexico's entry in the list of silly things to do. Not content with using a swimming pool like everybody else, they deem it to be more fun if you dive from a height of 118 feet, trying to miss the jagged rocks and judging it so that you land in the water when there is sufficient depth from the waves to avoid giving you a nasty headache. I'm only surprised that they didn't throw in a few sharks while they were at it.

Slalom ski-ing from France is an event often copied in computer games. Suffice to say that this is the hardest of the events and as yet, I have not even managed to complete the course, let alone do so without missing a gate. Monty Python fans will love the next sport as it allows you to play a Canadian Lumberjack trying to keep your feet as you go log rolling. Just to add to the fun, you must do this when there is someone else on the log, the game being to give him an early bath before he does likewise to you. Staying in North America, Bull Riding is the event chosen by the good old US of A. You can choose from four different bulls of assorted severity, the object being to stay on its back for at least eight seconds as it twists and bucks.

Back to the land of the porridge eaters for tossing the caber. Run up holding a telegraph pole and flip it over as far as you can. Not as easy as it sounds. A successful throw is accompanied by a Scottish jig, failures result in the caber landing on your foot or head, knocking you gradually into the ground in best cartoon tradition. The accompanying music is authentic bagpipes – i.e. awful. Finally to Japan for Sumo Wrestling, an event that shows that there is hope for us fatties yet. Thirty five stones of blubber on either side of the ring attempt to make their opponent either topple or step out of the ring.

As with all these Epyx games collections, you can have the most fun if there are several of you playing against each other. If you enjoyed the previous releases, then you will have to add this to your collection although personally, I preferred Winter Games. Surely, there can't be many sports now that have not been used.

G.R.H.

Touchline

Title: *World Games.* ***Supplier:*** *Epyx/US Gold, Unit 2/3, Holdord Way, Holford, Birmingham B6 7AX.* ***Tel:*** *021 356 3388.* ***Machine:*** *C64.* ***Price:*** *£10.95.*
Originality: *7/10.* ***Graphics:*** *8/10.* ***Playability:*** *8/10.* ***Value:*** *8/10.*

LEADER BOARD TOURNAMENT

Four new 18 hole courses to frustrate and annoy Commodore golfers are available on this first tournament disk.

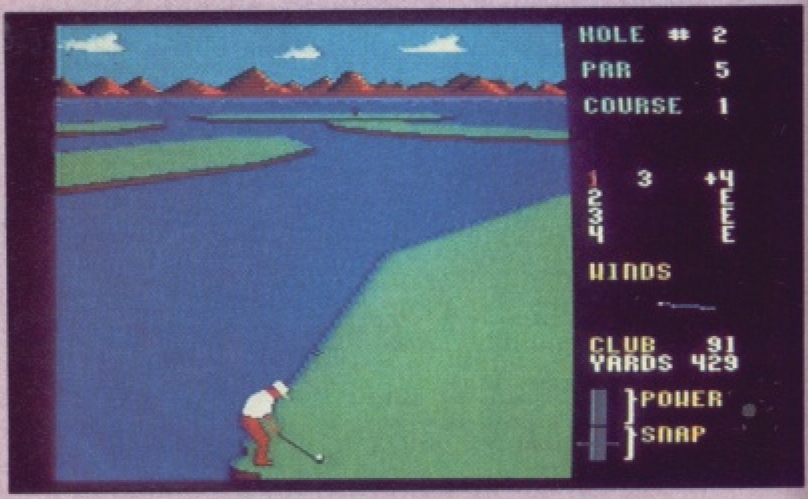
Available in either tape or disk format the new courses load in from the original Leader Board program (which you must have and in the same format) Tape Leader Boards can only load in the courses from tournament tapes!

Naturally the game plays the same with up to four players competing in either a 18, 36 or 72 hole tournament.

Club selection, aiming and swing are all controlled from simple joystick actions leaving you to worry about the hole itself.

Like the original courses the tournament holes are constructed from a series of islands marooned in a lake that likes to swallow golf balls by the dozen.

Most of the game will be spent pouring over the course diagrams working out which club is best to hop from one island to the next until you can finally sink the ball into the hole. Your caddy's no use, he's obviously too busy rowing you around the course in a boat!



The original Leader Board stormed its way to the top of the charts. Leader Board Tournament is quite simply more of the same sold at a realistic price.

If you enjoyed the original then you'll enjoy these extra courses. If you haven't played Leader Board then you should get that, then buy this.

T.H.

Touchline

Name: *Leader Board Tournament.* ***Company:*** *US Gold/Access, Units 2/3, Holford Way, Holford, Birmingham, B6 7AX.* ***Price:*** *£4.95.* ***Machine:*** *C64.*
Originality: *3/10.* ***Graphics:*** *7/10.* ***Playability:*** *10/10.* ***Value:*** *8/10.*

FIVE STAR GAMES

Five star games for the price of one is the claim of the latest collection from compilation kings, Beau Jolly.

Spindizzy, Batalyx, Zoids, Scarabaeus and Equinox form the impressive line up of hits.

Spindizzy was arguably the pick of the Marble games that swamped the market before the ink on the official license dried.

The game features either a top, marble or gyroscope exploring a 3D landscape of slopes, ledges and lifting platforms while collecting diamonds for invaluable bonus seconds.

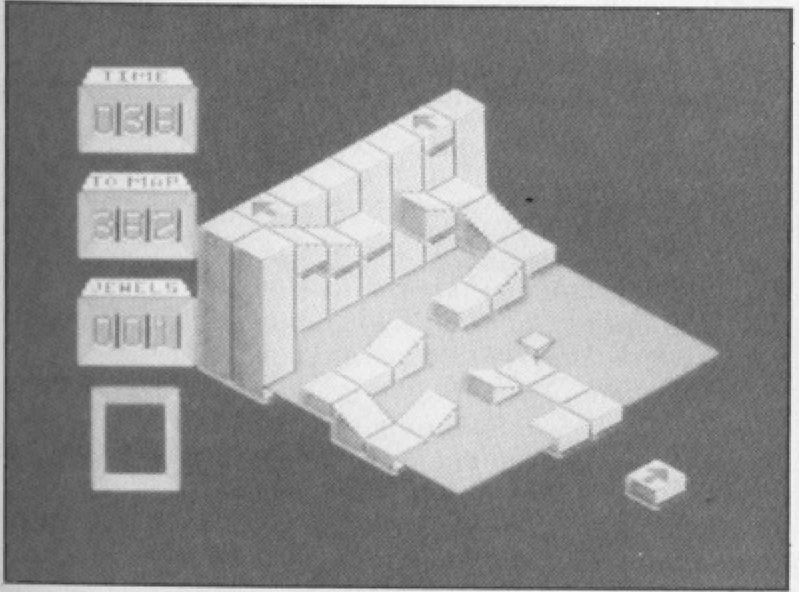
With over 385 screens to explore and solve it is unlikely that anyone will ever finish the game.

The same might also be true of Martech's excellent game based on the Zoids battle robots.

Merged with only a meagre Tank Zoid you must search the Red Zoid cities for the eight pieces that once were the mighty Zoidzilla. Find all eight and you'll be in a one to one battle with the Redhorn the Terrible but before then you must learn to control the Zoid you're merged with and then how to destroy the cities while fighting the red zoid patrols!

Icon controls monitor your Zoid's state of health as well as the position of enemy Zoids and the control and flight of your missiles.

Minter fans will revel in the inclusion of Batalyx which was a collection of Minter mayhem tacked together as subgames and distributed by Ariolasoft.



This is probably his worst game but my favourite is still Attack of the Mutant Camels.

Mikro-Gen's Equinox requires a curious mixture of arcade skills and strategic thought if you are to clear the radioactive canisters from the mining complex before they explode.

To have any chance of success you must master the use of teleporter terminals, trans level transporters, credit dispensers and magnetic lifts while fighting off the constant barrage of energy draining aliens.

Superb graphics add to the incredible atmosphere of this game that drives you back for more despite dismal scores.

Finally the collection is completed by Ariolasoft's arcade adventure, Scarabaeus.

This exploration, 3D maze game challenges you to find nine heiroglyphs and use them to sought potions from poisons, solve the pharoah's puzzle to find the key that will lead you into the tomb.

A puzzle solving game that is heiroglyphics to me.

Individually these five games have each attracted its own cult following. Together they make a winning combination.

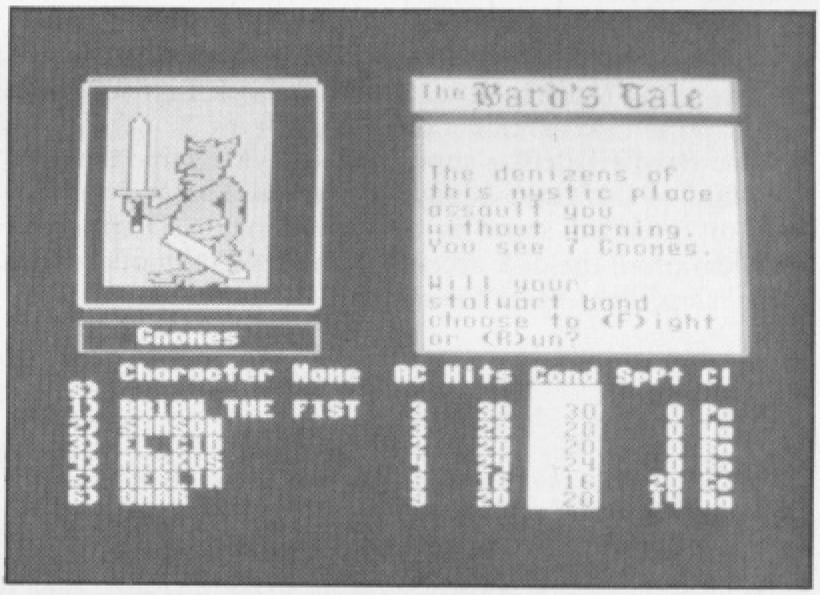
T.H.

Touchline

Name: *Five Star Games.* ***Company:*** *Beau Jolly.* ***Price:*** *£10.95.* ***Machine:*** *C64.*
Originality: *1/10.* ***Graphics:*** *9/10.* ***Playability:*** *8/10.* ***Value:*** *10/10.*

BARD'S TALE

Skara Brae as a pleasant, sleepy little town. Or at least it was until Mangar arrived. An evil magician, he cast a spell of Eternal Winter over the town, thus effectively isolating it



from the outside world. The last living things to enter were Mangar's specially invited guests – evil creatures of the night and foul monsters. It wasn't long before the town's militia disappeared leaving Skara Brae even more so under the evil mage's control. Only a few dared to talk of resistance. untried warriors and conjurers. Petty thieves already on the run and bards who would sing of the olden days for anyone who would buy them a tankdard of frothing ale.

For some reason or other, these rebel leaders look up to you as their leader. You must assemble a party of no more than six characters to go out and try to defeat Mangar. Of course, it is not going to be that easy. There will be his minions to defeat first and you will have to gain access to parts of the city not normally available to you. And then of course, there are the dungeons. So the bard sings, for no-one has ever found the entrance and lived to tell the tale.

You start off in the Adventurer's Guild, a safe haven, one of the few left in the city. Here you can assemble a part to your liking. Your choice is considerable. Seven races including dwarves, elves and gnomes. There are also 10 character classes (although not all are available at the start). Each character has five different attributes – strength, intelligence, dexterity, constitution and luck. Different classes and races

are higher in some attributes than others. It is no use having a clumsy rogue for example who can't tie his bootlaces let alone disable traps. One characteristic to look out for when generating a new character though is the number of hit points he or she has. This is an indication of the amount of damage a person can take before dying. If a character only has a few HPs, take a tip and roll the dice again.

Although your party has gold, it has no equipment so the first journey is to Garth's. An adventurer from years gone by, he has all the latest swords and armour. Gold can be pooled within the part to buy those really expensive goods. Garth will also identify unusual items for you – for a fee of course.

Magic plays an important part in the game. There are four different types of spell caster available, each with their own set of spells available – conjurers, magic users, sorcerors and wizards although you need to be a fairly experienced spell caster before you can become one of the latter two types. Bards are used to inspire the rest of the party by singing one of their songs They are reasonable fighters too but you will need to top them up with ale fairly frequently.

The display is in three main sections. Top left is a 3D picture of your surroundings or an illustration of your character or enemy. Top right is the description box – what you can see and what your choice are (all menu driven) and at the bottom of the screen is a quick run down on the status of your party. Movement is straightforward. Turn left, turn right, straight on or kick a door down!

The Bard's Tale is a superb role-playing game that will keep fans of this genre happy for months. That it is also the first of intended series is also good news. Despite the slowness of all the disk accessing (thanks Commodore) the game is excellent value for money.

G.R.H.

Touchline

Title: *The Bard's Tale.* ***Supplier:*** *Ariolasoft, 68 Long Acre, London WC2E 9JH.* ***Tel:*** 01 836 3411. ***Price:*** *£14.95.* ***Machine:*** *C64.*
Originality: **8/10.** ***Graphics:*** *8/10.* ***Playability:*** *7/10.* ***Value:*** *9/10.*

PSYCASTRIA

This is the latest in a long line of clones that have tried to ride on the back of the phenomenal success of Hewson's Uridium.

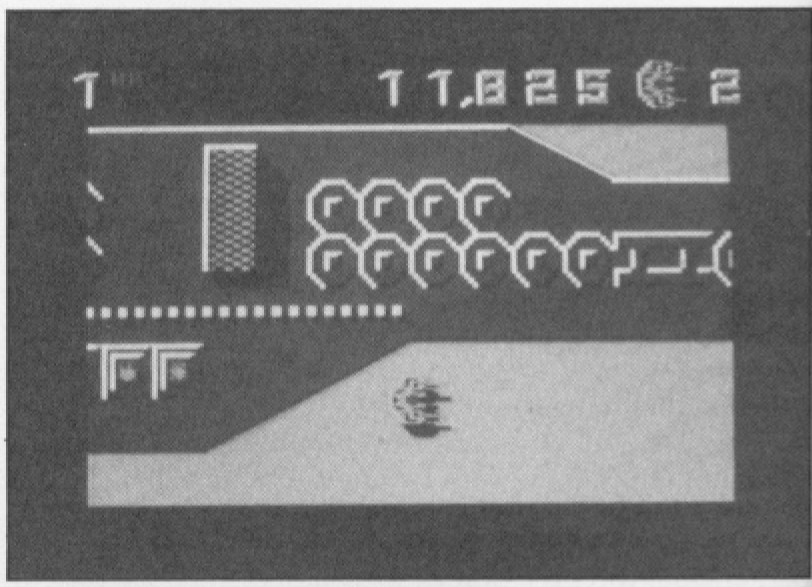
Once again you're flying a single fighter armed with twin firing lasers.

Once again you must brave the hordes of enemy fighters to take out land/ship installations to win the day.

Except in this game the fighters attack you in frightening hordes of one!

They do fire missiles so you still have to take them seriously but a greater threat is the raised barriers and walls that you can crash into.

Up to four players can share the "excitement" of it all and even marvel at the speech that says "tough luck sucker" at the end of every game. This rapidly becomes extremely annoying but can be turned off. So can the game unless you



like your games dull and unoriginal.

Later levels drift away from the designer Dreadnought look (Uridium style) with barriers forming for you to thread your way through. I don't think anyone will bother. If you want to play a Uridium style game then why not play Uridium or Firebird's Warhawk (a clone but at a budget price). This has nothing new to offer.

T.H.

Touchline

Name: *Psycastria.* ***Company:*** *Audiogenic, 33 Suttons Industrial Park, London Road, Reading RG6 1AZ.* ***Price:*** *£7.95.* ***Machine:*** *C64.*
Originality: *2/10.* ***Graphics:*** *6/10.* ***Playability:*** *5/10.* ***Value:*** *4/10.*

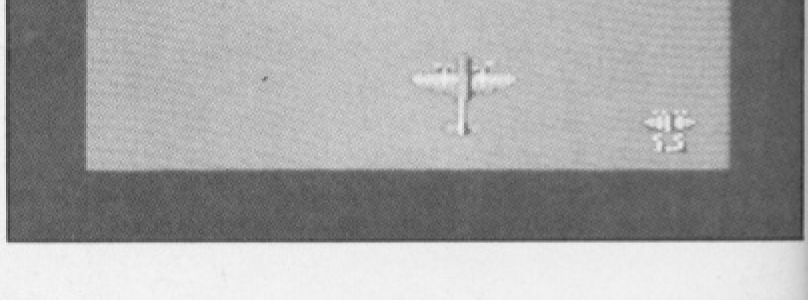
1942

It's 1942 and war in the pacific is raging.

You must fly your lone fighter on a daring solo mission to destroy the enemy's fleet and airforce in Elite's latest coin-op conversion.

Accompanied only by the wrong muic (633 Squadron hardly ever fought in the Pacific) you must blast your way through from carrier to carrier in 24 daring combat stages.

During each flight you are assaulted by hordes of enemy



fighters flying at you in battle formation.

Each individual formation is quite easy to take out but the problems add up when you're swamped with three or four formations each swirling around you in different patterns. Particularly nasty ones suddenly appear behind you or dive in from the side.

Occasionally the enemy fighters are joined by bombers that take several shots to destroy and fire a hail of bullets at you from the rear gunner.

At the end of each stage the next carrier appears and a bonus is awarded depending on your kill percentage.

In later stages the skies are packed with enemy bombers and fighters all trying to blast you.

Luckily, help is at hand in the mysterious POW capsules that are dropped. Collecting these gives your plane added features such as an increase in firepower and just might get you through to the next carrier.

T.H.

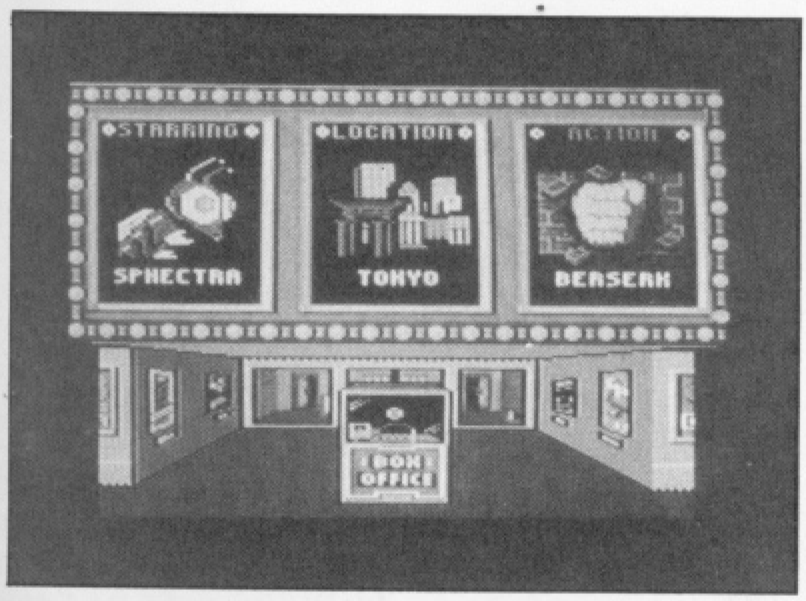
Touchline

Name: *1942.* ***Company:*** *Elite, 55B Bradford Street, Walsal WS1 3QD.* ***Tel:*** *0922 55852.* ***Price:*** *£9.95* ***Machine:*** *C64.* ***Originality:*** *3/10.* ***Graphics:*** *8/10.* ***Playability:*** *9/10.* ***Value:*** *8/10.*

THE MOVIE MONSTER GAME

Three years ago, Epyx released an excellent game of monstrous proportions for the Atari called Crush, Crumble and Chomp.

In the game you played a choice of monster from giant wasp to Godzilla who beat the hell out of the city of your choice.



Now the game has been revamped for the C64 and called the Movie Monster Game.

Now you can play Godzilla, a giant Meringe, Spectra the giant wasp. Tarantus a massive tarantula, a robot called Mechnatron or a blob called the Glog in a variety of movies where your chosen monstrosity tries to eat/escape from/destroy/generally give a bad time to one of the six major cities.

Naturally the loyal army and airforce are called out to stop whatever's stomping their city.

Each monster is unique in its strengths and weaknesses, some even have special weapons.

Godzilla is big, very big and can breathe fire. However he is also very slow whereas spectra is faster but a lot weaker, mechanatron fires lasers, Mr Meringue spits globe of goo, Glog dissolves everything in its acid and Tarantus traps tanks in its web.

Despite such potential the game has a power stronger than all the monsters it contains, it bores its players.

Once you've selected your critter and his task and you've read the all purpose introduction your monster crawls around the city at snail pace on a poorly scrolling screen. Stomped buildings don't shatter forming interesting piles of rubble instead they collapse totally leaving not a single brick!

Pedestrians wander aimlessly, seemingly unaware of the giant looming above them, and the airforce quite happily bomb you yet don't even mark the cities paint work!

Speed up the action and add some decent graphic effects and it could have been as good as the three year old original! It isn't and is Epyx's first UK monster flop!

Touchline

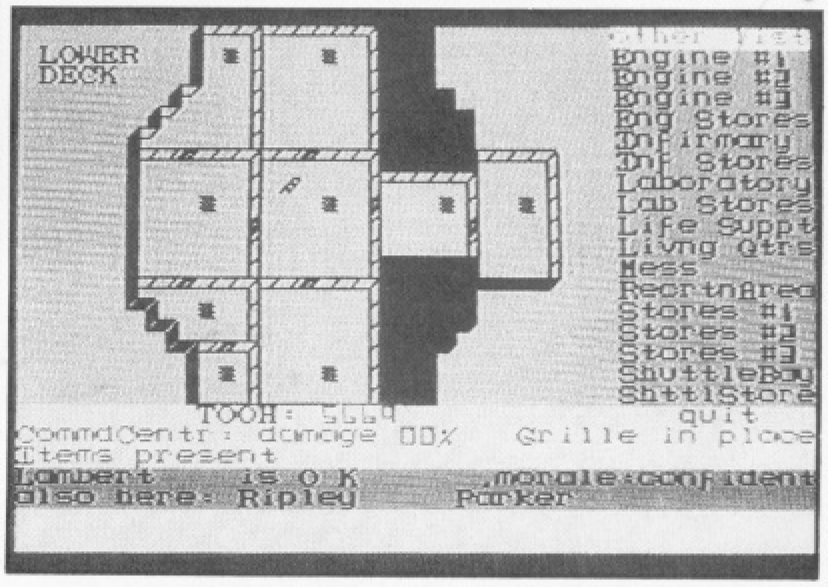
Name: *The Movie Monster Game.* ***Company:*** *US Gold/Epyx, Units 2/3 Holford Way, Holford, Birmingham B6 7AX.* ***Tel:*** *021 356 3388.* ***Price:*** *£9.99.* ***Machine:*** *C64.* ***Originality:*** *2/10.* ***Playability:*** *4/10.* ***Graphics:*** *5/10.* ***Value:*** *6/10.*

ALIEN

For those of you who missed it the first time around, Bug Byte has re-released the game of the film, Alien, at a budget price of £2.99. Having missed it myself I was looking forward to showing the alien just who was boss.

The aim of your mission is either to totally destroy the alien or else drive it out of the spacecraft Nostromo. To escape you can leave the ship in the escape pod Narcissus with at least three other crew members and set the ship's self destruct mechanism to auto.

The game supports what is generally termed as Personality Control System – PCS. This means that as Commander, you have to be able to read and understand the



personalities of each of your crew. For example, if one of the crew suffers from claustrophobia, you couldn't send that person into a narrow air duct. Likewise, if one of them is feeling slightly cowardly, you don't send them to attack the Alien. To aid you in this you are provided with a rundown of each of the crew members strong and weak points. Beware though, these traits can alter as the game progresses, depending upon the situation at the time.

Control is by use of a joystick and a few keys. You may view all the decks of the Nostromo via a deck plan. This will show where grills, stairs and doorways are. The command monitor gives you all your options. From the command monitor you manipulate each crew member, use items which you have acquired and examine damage reports. One thing to watch for is TOOH (Time out of Hypesleep). If a crew member's TOOH falls to zero then they die.

I must confess that I did not do particularly well at this game. I found that the game play takes some getting used to. A map must be kept of where each crew member is and progress made. Otherwise you will get totally lost. All in all, noit a bad game. The graphics are nothing to write home about and the sound, although functional is nothing special (except the nice intro).

Shoot 'em up and platform game players will not, I fear, get on with this game. However, strategists amongst you will find there is plenty here to keep you occupied for many an hour.

P.E.

Touchline

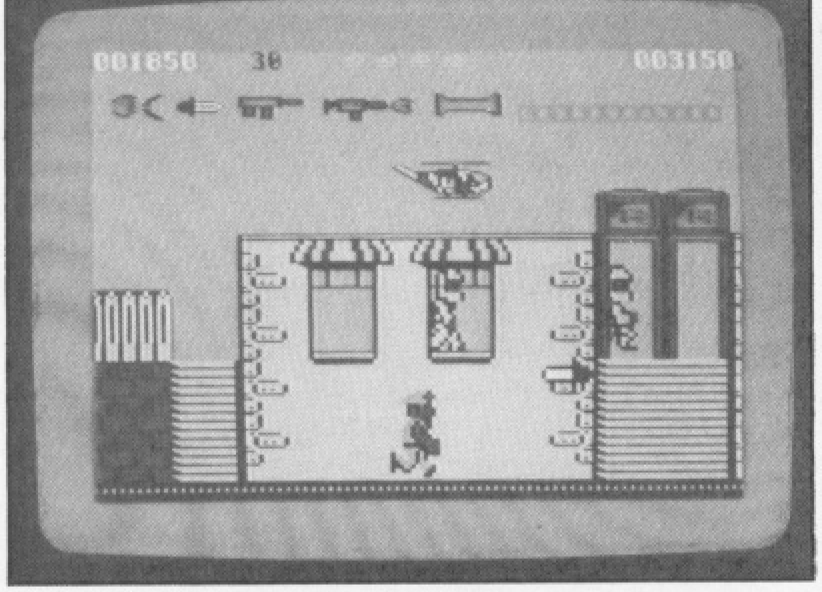
Title: *Alien.* ***Company:*** *Bug Byte, Victory House, Leicester Place, London WC2H 7NB.* ***Tel:*** *01 439 0666.* ***Machine:*** *C64.* ***Price:*** *£2.99.*
Originality: *6/10.* ***Playability:*** *6/10.* ***Graphics:*** *4/10.* ***Value:*** *8/10.*

BAZOOKA BILL

General MacArthur has been kidnapped and is being held by revolutionary forces on an island in the Pacific.

You are Bazooka Bill, soldier of fortune, and it's your job to get him back.

Although unarmed you set off hoping you'll find sufficient weapons and supplies to survive the mission.



Waiting to stop you are hordes of heavily armed soldiers as well as tanks, planes and helicopters.

The game plays like a mixture of Green Beret and Commando, as Bill charges along a two level scrolling screen punching anything in his way.

Occasionally he will find a knife, flame thrower, machine gun or even a bazooka to help him in his carnage but most of the time you'll have to rely on your deadly self-loading fists.

The screens can be a little confusing as, if you think you're running along the bottom level you may in fact be simply running around the same building. Therefore you must keep an eye on the background and if you see anything familiar simply leap up to the next level to get out of the rut.

This "feature" is obviously included as the bottom level is less dangerous than the upper level which is packed with machine gunning troops.

If you reach the airport you can steal a plane and blast your way through incredibly crowded skies.

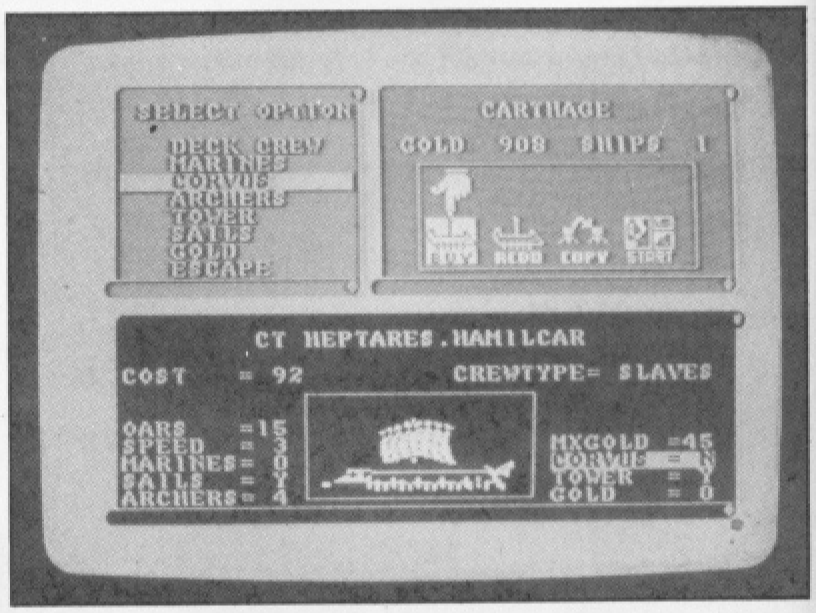
You begin the game with five lives and can gain more by killing the enemy by the ton (100 corpses and you get a new life).

The action is fast, furious and a lot of fun accompanied by some boppy music to stir you on to heroic deeds and another game.

T.H.

Touchline

Name: *Bazooka Bill.* ***Company:*** *Melbourne House, 60 High Street, Hampton Wick, Kingston-upon-Thames, Surrey KT1 4DB.* ***Machine:*** *C64.* ***Price:*** *£9.95.*
Originality: *4/10.* ***Graphics:*** *7/10.* ***Playability:*** *9/10.* ***Value:*** *8/10.*



LEGIONS OF DEATH

The Punic Wars between the Roman and Carthaginian empires lasted for over 120 years. Carthage, on the North African coast, had established its empire through trading and the might of its navy. Rome depended more on the power of its army. That the Romans negated the naval powers of their enemy is now a matter of history, but here is your chance to see if things would have been different if you had been in command over two thousand years ago.

Legions of Death is a fully icon driven wargame and Lothlorien's most impressive result to date. Set in the central

Mediterranean, you take the side of the Carthaginians against either the computer or another human opponent as you struggle for mastery of the seas.

Before the game starts, you must first equip your navy. Do you go for lots of fast manoeuvrable ships which are lightly armed or better specified but slower models. And how do you equip them? Should you use slaves to row the boats or hire expert oarsmen? How many marines or archers should you carry and have you left enough room to carry gold back from the tributes paid by friendly cities to your capital. This theme of spending your money wisely is crucial throughout the game.

The display is divided into four main boxes. On the left is a large map. This can be either a general map of the area or a close up of a specific area when issuing orders. The box in the top right hand corner contains icons of the commands currently available to you while underneath is either another close up map or a picture of the ship currently selected. An information box is at the bottom of the screen.

Commanding your forces is controlled entirely by selecting the appropriate icon. Some of these lead you into sub-menus and the same icon has several different meanings according to where it occurs. A flow chart of the various permutations is included in the documentation. It is rather daunting at first but you soon get the hang of things.

Prepare to be well and truly beaten the first few times that you play. Not only do you get the chance to set your own victory conditions (there are default values) but also the initial disposition of your forces and it takes some time to get used to the optimum strategy. Once you have that sorted out, all you have to do is set courses and speeds for your ships, rebuild and repair them, collect your tributes, destroy the enemy fleet and generally become master of the Ancient World. Just don't tell the galley slaves that you want to go water skiing after a quick row to Rome and back.

Legions of Death is a very well presented wargame. A lot of thought has gone into the gameplay and it shows. The amount of detail and available options are excellent and the displays are large and legible. Highly recommended to all wargamers and anyone else who wants to act out their Latin lessons.

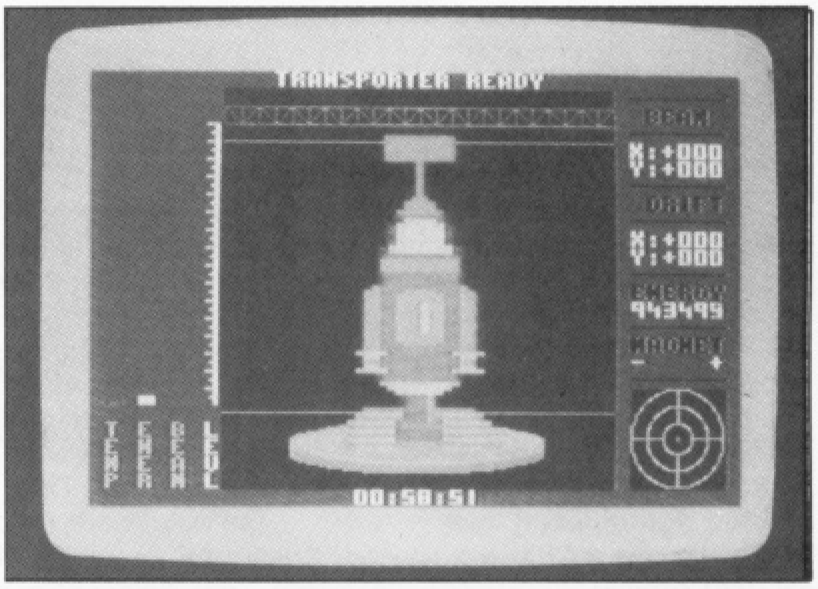
G.R.H.

Touchline

Title: *Legions of Death.* ***Supplier:*** *Lothlorien, APS, Victory House, Leicester Place, London WC2H 7NB.* ***Tel:*** *01 439-0666.*
Machine: *C64.* ***Price:*** *£9.95.*
Originality: *9/10.* ***Graphics:*** *8/10.* ***Playability:*** *7/10.* ***Value:*** *8/10.*

NUCLEAR EMBARGO

By the middle of the 21st century, the Earth was totally dependant on nuclear fuel for all its energy supplies. Its own resources having long since been used up, a trade agreement was struck with Saturn. We would give them the technology and they would give us the Uranium – their moons were full of the stuff. All went well until Rayol the perverse ruled Saturn. He decided that he wanted payment in human flesh for his zoo, something that the powers that be naturally refused. As the situation was becoming desperate, the crisis



committee decided to launch a raid on Saturn's moon in order to liberate the Uranium supplies necessary. You are the pilot on that mission.

On first loading, I though that this was going to be another Star Trek variant as I was presented with a 10 by 10 stellar map depicting the position of the various moons. Fortunately, this proved not to be the case and the rest of the game is highly original. Your first task is to select a plant to warp to. Preferably one with zero gravity. The view now shifts to a close up of the moon surface. This you must explore using your X-ray detector in order to find the location of the Uranium. Spy satellites try to pick up your trail. If they are successful, then the ground forces open fire on you and must be eliminated.

You can now switch to the transporter room. You have nine droids at your disposal and must attempt to teleport one on to the surface of the moon. This involves manipulating energy and beam levels while at the same time, making sure that the droid does not overheat. The lower the gravity of the moon, the easier it is to accomplish the transfer.

Once on the moon, you have remote control over the droid as it explores the surface looking for Uranium dumps. Look out though for the laser batteries that will try to destroy the droid. There are also computer rooms to be sought out. A mini mastermind game allows you to temporarily disable the defences. Once you have stocked up, its a case of beaming back up to the ship and on to the next moon. Extra energy can be picked up by visiting and blasting a pulsar.

Nuclear embargo is really a collection of mini games but they work well when viewed as a whole and the result is both original and fun to play.

G.R.H.

Touchline

Title: *Nuclear Embargo.* ***Supplier:*** *Micropool, 4 Mercury House, Aldermaston, Berks RG7 4QW.* ***Tel:*** *07356 77486.*
Machine: *C64.* ***Price:*** *£12.95 disk.*
Originality: *7/10.* ***Graphics:*** *8/10.* ***Playability:*** *8/10.* ***Value:*** *7/10.*

Listings

Get it right first time with our deluxe program system for the C64.

You may have noticed that our listings are free of those horrible little black blobs which send you searching around the keyboard for a suitable graphic symbol. You may also have noticed the funny numbers by the side of each line of the listing. Fret no more, it's all part of our easy entry aid.

Instead of those nasty graphics and rows of countless spaces in PRINT statements and strings we use a special coding system. The code, or mnemonic, is always contained in square brackets and you'll soon learn to decipher their meanings.

For example, [SA] would mean type in a Shifted A, or an ace of spades in layman's terms, and [SA10] would mean a row of ten of these symbols.

[S+2] means hold down the shift key and press the plus key twice. It doesn't take a great leap of logic to realise that [C+2] means exactly the same thing except that the Commodore key (bottom left of the keyboard) is held down instead of the shift key.

If more than two spaces appear in a statement then this will be printed as [SPC4] or, exceptionally, [SSPC4]. Translated into English this means press the spacebar four times or in the latter case hold the shift key down while you do it.

A string of special characters could appear as:

[CTRL N, DOWN2,LEFT5,BLUE, F3,C3]

This would be achieved by holding down the CTRL key as you press N, press the cursor key down twice, the cursor left key five times, press the key marked BLUE while holding down the CTRL key, press the F3 key and, finally hold the Commodore key down while pressing the number two key (C2 would of course make the computer print in brown).

Always remember that you should only have a row of graphics characters on your screen with no square brackets and no commas, unless something like this appears:

[SS],[C*]

In this case the two characters should have a comma between them.

On rare occasions [REV T] will appear in a listing. This is a delete symbol and is created by entering the line up to this mnemonic. Then type a closing quotation mark (SHIFT & 2) and delete it. This gets the computer out of quotes mode. Hold down CTRL and press the number nine key (RVSON), type the relevant number of reversed T's and then hold down CTRL and press zero (RVSOFF). Next type another quotation mark and delete it again. Now finish the line and press RETURN.

A list of these special cases is given in the table but remember that only one of these mnemonics will appear outside of a PRINT string: the symbol for pi. This may appear when its value is needed in a calculation so this may look something like:

:CC=2*[PI]*R:

Ignore the square brackets and just type in a shifted upward pointing arrow (ie. the pi symbol).

PROGRAM: SYNTAX CHECKER

```
5 REM SYTAX CHECKER - ERIC DOYLE

10 BL=10   :LN=70   :SA=49152
20 FOR L=0 TO BL:CX=0:FOR D=0 TO
 15
30 READ A:IF A>255THENPRINT"NUMB
ER TO LARGE";LN+(L*10):STOP
40 CX=CX+A:POKE SA+L*16+D,A:NEXT
 D
50 READ A:IF A><CX THENPRINT"ERR
OR IN LINE";LN+(L*10):STOP
60 NEXT L:SYS 49152:NEW
70 DATA 173,5,3,201,165,208,31,1
20,169,9,141,32,208,141,33,208,1
847
80 DATA 169,7,141,134,2,169,13,3
2,210,255,169,64,141,4,3,169,168
2
90 DATA 192,141,5,3,88,96,120,16
9,124,141,4,3,169,165,141,5,1566

100 DATA 3,169,14,141,134,2,141,
32,208,169,6,141,33,208,88,96,15
85
110 DATA 32,124,165,72,138,72,15
2,72,162,0,165,20,133,254,165,21
,1747
120 DATA 24,101,254,133,254,189,
0,2,240,18,69,254,133,254,232,18
9,2346
130 DATA 0,2,240,8,24,101,254,13
3,254,232,208,233,169,1,141,134,
2134
140 DATA 2,165,254,74,74,74,74,3
2,156,192,32,210,255,165,254,41,
2054
150 DATA 15,32,156,192,32,210,25
5,169,13,32,210,255,169,13,32,21
0,1995
160 DATA 255,169,7,141,134,2,104
,168,104,170,104,96,24,105,48,20
1,1832
170 DATA 58,16,1,96,24,105,7,96,
0,0,0,0,0,0,0,403
```

by Eric Doyle

Checksum Program

The hexadecimal numbers appearing in a column to the left of the listing should not be typed in with the program. These are merely checksum values and are there to help you get each line right. Don't worry if you don't understand the hexadecimal system, as long as you can compare two characters on the screen with the corresponding two characters in the magazine you can use our line checking program.

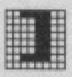
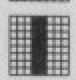
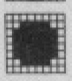
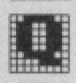
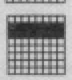
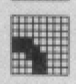
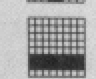
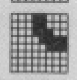
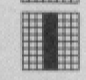
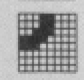
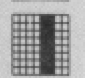
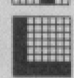
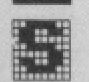
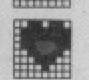
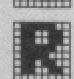
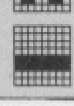
Type in the Checksum Program, make sure that you've not made any mistakes and save it to tape or disk immediately because it will be used with most of the present and future listings appearing in Your Commodore.

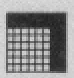
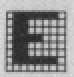
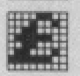
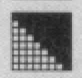
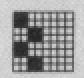
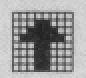
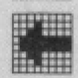
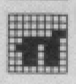
At the start of each programming session, load Checksum and run it. The screen will turn brown with yellow characters and each time you type in a line and press the RETURN key a number will appear on the screen in white. This should be the same as the corresponding value in the magazine.

If the two values don't relate to one another, you have not copied the line exactly as printed so go back and check each character carefully. When you find the error simply correct it and press RETURN again.

If you want to turn off the checker simply type SYS49152 and the screen will return to the familiar blue colours. You can then do whatever it was you wanted to do and if this doesn't use the area where Checksum lies you can go back to it with the same SYS command.

No system is foolproof but the chances of two errors cancelling one another out are so remote that we believe our listings are more reliable than any other magazine in the world. So get typing! YC

Mnemonic	Symbol	Keypress
[RIGHT]		CRSR left/right
[LEFT]		SHIFT & CRSR left/right
[DOWN]		CRSR up/down
[UP]		SHIFT & CRSR up/down
[F1]		f1 key
[F2]		SHIFT & f1 key
[F3]		f3 key
[F4]		SHIFT & f3 key
[F5]		f5 key
[F6]		SHIFT & f5 key
[F7]		f7 key
[F8]		SHIFT & f7 key
[HOME]		CLR/HOME
[CLR]		SHIFT & CLR/HOME
[RVSON]		CTRL & 9
[RVSOFF]		CTRL & 0

Mnemonic	Symbol	Keypress
[BLACK]		CTRL & 1
[WHITE]		CTRL & 2
[RED]		CTRL & 3
[CYAN]		CTRL & 4
[PURPLE]		CTRL & 5
[GREEN]		CTRL & 6
[BLUE]		CTRL & 7
[YELLOW]		CTRL & 8
[POUND]		£
[LARROW]		←
[UPARROW]		↑
[PI]		SHIFT & ↑
[INST]		SHIFT & INST/DEL
[REV T]		see text
[Cletter]		CBM + letter
[Sletter]		SHIFT + letter

Hex Data Entry

Introducing the Your Commodore Hex Data Entry Program to make our listings even more accessible.

By M.C. Stretton assisted by P.A. Eves

The *Your Commodore* Hex Data Entry program has been written with you, the reader in mind. No longer will it be a painstaking ordeal, typing in all the long lists of data. This program will ensure a 100% correct entry, each and every time you use it.

I have made this version as streamlined as possible so as to save you having to type in a large program. There are only four options in this version: LOAD DATA; SAVE DATA; ENTER DATA; PRINT DATA. There will be a much larger version coming shortly which will give lost more options and will have Windows, Redefined Chars, Scrolling Text etc.

On first entering the Hex Data Entry, only the LOAD DATA and DATA ENTRY options are available to you. This is because the buffer is empty, and the other two options require data to be present. On selecting the LOAD DATA option, you are asked for TAPE or DISK. Press either 'T' or 'O' then RETURN. The program remembers that last input/output, and so it is possible to just hit RETURN if the correct device type is being displayed. You are then required to enter a filename.

Tape users please note, to cut down on errors for disk users, you will not be allowed to enter a blank filename. Filenames can be a combination of any characters, except graphics, up to 16 in number. If you should make an error in your filename entry, you may either delete single characters by the DEL key, or SHIFT/CLRHOME will delete the whole filename. Be extremely careful when typing in your filename, errors can be fatal, so make sure you only use filenames that are stored on whatever device you are using. After the prompt, hit return and the file will be loaded into the buffer. The program will allow files up to 95 blocks in length to be loaded in. If you want larger programs entered, you will have to split them into two or more parts first. After the load, control is passes back to the main menu.

The save option is identical to the load, except that it takes the contents of the buffer and saves them out to the given start address. This will save an executable file, that can be loaded and run, independant of the Input program.

Data Entry

The Data Entry option is the option by which you can enter data from *Your Commodore*, or your own creations. Once this option is selected you are asked if you want to continue from the given address. If you have just 'LOADed' a file, this address will be the next available byte in the buffer. (Allowing you to add more data to the end of the loaded file). This is also true of the program currently in memory. Therefore if you wish to continue typing in at the last address, type 'Y'. If 'N' is pressed the program assumes you are starting a fresh entry. When this happens the buffer is reset to zero, thus losing any program currently in memory. (I have chosen $C000 as the normal start up address purely because most M/C progs reside here.) After pressing 'N', you are then asked for the starting address, in Hex. Any valid Hex number is acceptable, e.g. $400, $C00, $0400. In this example, the first figure, $400, would be interpreted as $0400 by the program. Likewise $286 is taken to be $0286.

Once the start address is given, you are asked if you want checksums or not. If you are typing in a program from *Your Commodore* your response will be 'Y'. If you are entering your own program then select 'N'.

The screen display now changes to show the current address being poked into. Type any valid Hex number and the program automatically skips the next byte without the need to type commas, spaces or returns. If you make a mistake, one press of the DEL key will erase the whole number. If in the no checksum mode, when you get to the end of the line, the line will automatically scroll up ready for your next input.

If in checksum mode, after eight bytes are entered you must type the two digit checksum at the end of the line. Unlike the no checksum mode you now press return to enter the line.

If the program finds that the checksum does not match the line entered, a warning tone will be sound. You will then be asked if you wish to either: a) Re-enter the line or b) Re-enter the checksum.

After checking your line, if you find you have entered it wrongly, then press 'L'. The line will be erased and you then re-enter it correctly. If you find that you have only made a mistake in typing in the checksum, then press 'C' and re-enter it. Should you wish to stop entering data, simply press return or space bar on a blank line to get you back ot the main menu. Here you may save your program so as to restart another day, or you may wish to see a printout.

On choosing the print option, you have a choice or hard copy or screen copu. The listing can be paused at any time by pressing down and holding down any key. Pressing the RUN/STOP key and holding it down will breat out of the print mode and return you to the main menu.

The left arrow key 'top left of the keyboard', acts as zero when typing in your data. The space bar acts as the return key when entering dats, thus leaving you free from searching for the return key.

The load option allows any program, less than 95 blocks, to be loaded into the buffer, so it is possible to load a basic program, obtain a Hex dump, then resave the program out to another tape or disk without harming it in any way.

I hope that this program will help to take the drudgery out of typing in long lists of date statements. YC

```
Please use SYNTAX CHECKER
when entering this program

READY.

EC  10 REM ------------- SETUP --
    ------------
AF  20 POKE788,52:CLR
03  30 DV=8:BU=16384:POKE650,128
    :POKE53280,12:POKE53281,12:P
    OKE646,1:PRINT"[CLR,REV H,RE
    V SN]"
D6  40 CA$="$C000":CA=49152:SA=C
    A:TI=0
C8  50 GOSUB2180
5E  55 PRINT"[CLR]";
EF  60 REM ------------- OPTIONS
    ------------
0D  70 PRINT"[HOME,RVSOFF,BLACK,
    C@40]";
7F  80 PRINT"[RVSON,BLACK] YOUR
    COMMODORE HEX INPUTTER - (C)
     1986 ";
11  90 PRINT"[RVSON] -DESIGNED A
```

```
   ND WRITTEN BY M C STRETTON-
   [RVSOFF]";
68 95 PRINT"[RVSON,SPC10]ASSIST
   ED BY P A EVES[SPC10,RVSOFF]
   ";
30 100 PRINT"[WHITE,DOWN6,RIGHT
   13][F1] LOAD DATA"
14 110 PRINT"[DOWN2,RIGHT13][F3
   ] SAVE DATA"
0B 120 PRINT"[DOWN2,RIGHT13][F5
   ] DATA ENTRY"
5D 130 PRINT"[DOWN2,RIGHT13][F7
   ] PRINTER"
05 140 GOSUB1250
9B 150 ONFKGOSUB1650,1770,180,8
   60
50 160 GOTO70
23 170 REM ------------ HEX INP
   UT ---------
BA 180 GOSUB1970
DB 190 PRINT"[HOME,DOWN,BLACK,R
   VSON]CONTINUE FROM[SPC27,UP,
   RIGHT14]";CA$
F4 200 POKE198,0:WAIT198,1:GETA
   $
F9 210 IFA$="N"THENBU=16384:GOT
   O240
CE 220 IFA$="Y"THENPRINT"[WHITE
   ]";:GOTO260
C1 230 GOTO200
EB 240 PRINT"[HOME,DOWN,BLACK,R
   VSON]DATA ADDRESS: $....[SPC
   21,UP,RIGHT15]";
B5 250 GOSUB1320:PRINT"[WHITE,R
   VSOFF]";:HH$=IN$:GOSUB1190:S
   A=DE:CA=DE:CA$=HH$
6A 260 PRINT"[HOME,DOWN,BLACK,R
   VSON,SPC4]DO YOU WISH TO ENT
   ER CHECKSUMS?[SPC5,RVSOFF]";
2D 270 POKE198,0:WAIT198,1:GETA
   $
88 280 IFA$="N"THENZZ=1:GOTO310
C0 290 IFA$="Y"THENZZ=0:GOTO310
11 300 GOTO270
A5 310 PRINT"[CLR,WHITE]";
87 320 SYS59626
0B 321 TT=0
6B 325 GOSUB580
86 330 B=SA:KA=SA:IN$=""
40 340 GOSUB1250
BA 350 L=LEN(IN$)
77 360 IFA$=CHR$(20)THENGOSUB53
   0:GOTO340
C3 370 IFA$=CHR$(13)ANDTN=0THEN
   PRINT"[CLR]":RETURN
12 380 IFA$=CHR$(32)ANDTN=0THEN
   PRINT"[CLR]":RETURN
30 390 IFA$="←"THENA$="0":GOTO4
   30
53 400 Y=0:IFASC(A$)>47ANDASC(A
   $)<58THENY=1
66 410 IFASC(A$)>64ANDASC(A$)<7
   1THENY=1
F1 420 IFY=0THEN340
37 430 PRINTA$;:DN=DN+1:IFDN=2T
   HENPRINT" ";:GOTO450
18 440 IN$=IN$+A$:GOTO340
1E 450 IN$=IN$+A$
3E 460 HH$=IN$:GOSUB1190
A6 470 POKE BU,DE:CA=CA+1:BU=BU
   +1:DN=0:TN=TN+1:IN$=""
95 480 IFTN=8ANDZZ=1THENGOTO320
F8 490 IFTN=8ANDZZ=0THENPRINT"[
   RIGHT3]";:GOSUB720:GOSUB640
AD 500 IFTN=8ANDCH$=CK$THENGOTO
   320
01 510 IFTN=8ANDCH$<>CK$THENGOS
   UB2040:GOTO525
B2 520 GOTO340
18 525 ONQQGOTO529,526
F9 526 PRINT"[HOME,WHITE,DOWN24
   ,RIGHT37]";
AE 527 PRINT"..[LEFT5]";
26 528 GOTO490
E2 529 BU=BU-8:CA=CA-8:GOTO325
AD 530 IFTN=0THENGOSUB550:RETUR
   N
A0 540 IFDN=0THENPRINT"[LEFT3].
   [LEFT2]";:TN=TN-1:BU=BU-1:C
   A=CA-1:IN$="":RETURN
8F 550 IFL=>1THENIN$=LEFT$(IN$,
   L-1):PRINT"[LEFT].[LEFT]";:D
   N=DN-1
BC 560 RETURN
D7 570 REM ----------- NEWLINE
   -----------
93 580 IFBU<40951THEN585
14 581 GOSUB2560:PRINT"[HOME,DO
   WN,RVSON]WARNING: BUFFER ALM
   OST FULL-8 BYTES LEFT[WHITE]
   ";
D7 582 FORA=1TO4000:NEXT:GOSUB2
   160
F9 585 DE=CA:GOSUB1110:CA$=LEFT
   $("$0000",5-LEN(HH$))+HH$
65 590 PRINT"[HOME,DOWN24,RIGHT
   ,WHITE]";CA$;"[SPC4].. .. ..
   .. .. .. .. ..";
78 600 IFZZ=0THENPRINT"  : ..";
C6 610 PRINT"[HOME,DOWN24,RIGHT
   10]";:TN=0:DN=0:IN$="":RETUR
   N
14 620 REM --------- CHEXUM ---
   -----------
EB 640 CH=0
16 650 IFCA=SATHENRETURN
BD 660 FORX=1TO8:CH=CH+(X*(PEEK
   ((BU-9)+X))):NEXT
26 665 CH=CH+CA-8
CE 670 CH=CH-INT(CH/256)*256:DE
   =CH:GOSUB1110:CH$=MID$(HH$,3
   )
30 680 IFCH$<>CK$THENTT=1
3A 690 RETURN
ED 710 REM ----------- GETCHECK
   -----------
61 720 POKE198,0:CK$=""
C3 730 GETL$:IFL$=""THEN730
41 740 L=LEN(CK$):IFL$=CHR$(20)
   ANDL>0THEN760
B7 750 GOTO770
72 760 CK$=LEFT$(CK$,L-1):PRINT
   "[LEFT].[LEFT]";:GOTO730
80 770 IFL$=CHR$(13)ANDL=2THENC
   K=VAL(CK$):RETURN
D2 780 IFL$=" "ANDL=2THENCK=VAL
   (CK$):RETURN
60 790 IFL$="←"THENL$="0"
1B 800 Y=0:IFASC(L$)>47ANDASC(L
   $)<58THENY=1
F0 810 IFASC(L$)>64ANDASC(L$)<7
   1THENY=1
28 820 IFY=0ORL=2THEN730
3B 830 PRINTL$;
60 840 CK$=CK$+L$:GOTO730
87 850 REM ---------- PRINTER -
   -----------
C9 860 IFCA=SATHENRETURN
62 870 GOSUB1970:PRINT"[HOME,DO
   WN,RVSON,BLACK,SPC6]PRINT TO
    SCREEN OR PRINTER?[SPC7]"
A3 880 POKE198,0:WAIT198,1:GETK
   $
0E 885 IFK$=CHR$(136)THENPRINT"
   [WHITE,CLR]":RETURN
99 890 IFK$="S"THENNU=3:GOTO940
49 900 IFK$="P"THENNU=4
A1 910 IFK$<>"S"ANDK$<>"P"THEN8
   80
E9 920 PRINT"[HOME,DOWN,BLACK,R
   VSON]  SWITCH ON PRINTER THE
   N PRESS RETURN[SPC3]"
E9 930 POKE198,0:WAIT198,1:GETA
   $:IFA$<>CHR$(13)THEN920
CD 940 OPEN3,NU:PRINT#3
11 950 PS=16384:PE=16384+(CA-SA
   ):PC=PS:AS=SA:IFPE=PSTHEN109
   0
11 960 PRINT"[CLR]"
65 970 IFPEEK(197)=63THENPRINT"
   [WHITE,CLR]":AS=CA:GOTO1080
16 975 IFPEEK(203)<>64THEN970
20 980 DE=AS:GOSUB1110:CA$=LEFT
   $("0000",4-LEN(HH$))+HH$
82 990 CK=0:PRINT#3,"[SPC4]";CA
   $;
C9 1000 FORX=0TO7:Q=FRE(0)
38 1010 DE=PEEK(PC+X):GOSUB1110
   :B$=RIGHT$(HH$,2)
62 1020 PRINT#3," ";B$;:NEXTX
8A 1030 GOSUB1990
38 1040 PRINT#3," :"+CH$
8A 1050 PC=PC+8:AS=AS+8:KA=KA+8
   :KB=KB+8
B8 1060 IFPC<PETHENGOTO970
8A 1070 IFNU=3THENPOKE198,0:WAI
   T198,1
4E 1080 PRINT"[CLR]":DE=AS:GOSU
   B1110:CA$=LEFT$("$0000",5-LE
   N(HH$))+HH$
2B 1090 POKE198,0:PRINT#3:CLOSE
   NU:PRINT"[CLR]":RETURN
1C 1100 REM -------- DEC-HEX --
   -------------
06 1110 A=INT(DE/256):B=DE-A*25
   6:C=INT(A/16):D=A-16*C
3B 1120 C$=CHR$(48+C):IFC>9THEN
   C$=CHR$(C+55)
0E 1130 D$=CHR$(48+D):IFD>9THEN
   D$=CHR$(D+55)
FA 1140 E=INT(B/16):F=B-16*E
3F 1150 E$=CHR$(48+E):IFE>9THEN
   E$=CHR$(E+55)
36 1160 F$=CHR$(48+F):IFF>9THEN
   F$=CHR$(F+55)
EA 1170 HH$=C$+D$+E$+F$:RETURN
88 1180 REM ------------ HEX-DE
   C -----------
45 1190 IFLEN(HH$)<4THENHH$=LEF
   T$("0000"+HH$,4-LEN(HH$))+HH
   $
87 1200 A=ASC(HH$)-48:B=ASC(MID
   $(HH$,2,1))-48
34 1210 C=ASC(MID$(HH$,3,1))-48
   :D=ASC(MID$(HH$,4,1))-48
5D 1220 DE=256*(16*(A+7*(A>9))+
   B+7*(B>9))+16*(C+7*(C>9))+D+
   7*(D>9)
5C 1230 RETURN
AC 1240 REM ------------ F KEY
   S ----------
89 1250 FK=0
9C 1260 POKE198,0:WAIT198,1:GET
   A$
F2 1270 IFA$=CHR$(133)THENFK=1
A9 1280 IFA$=CHR$(134)THENFK=2
95 1290 IFA$=CHR$(135)THENFK=3
51 1300 IFA$=CHR$(136)THENFK=4
AD 1310 RETURN
E0 1320 REM ---------- GET ADDR
   ESS --------
DA 1330 IN$=""
4A 1340 GETL$:IFL$=""THEN1340
27 1350 L=LEN(IN$):IFL$=CHR$(20
```

```
    )ANDL>0THEN1370
46  1360 GOTO1380
B5  1370 IN$=LEFT$(IN$,L-1):PRINT"[LEFT].[LEFT]";:GOTO1340
D1  1380 IFL$=CHR$(13)ANDL>0THEN RETURN
49  1385 IFL$=CHR$(32)ANDL>0THEN RETURN
3B  1390 FLAG=0:IFASC(L$)>47ANDASC(L$)<58THENFLAG=1
63  1400 IFASC(L$)>64ANDASC(L$)<71THENFLAG=1
13  1410 IFFLAG<>1THENGOTO1340
3B  1420 IFL=4THENGOTO1340
A5  1430 PRINTL$;
88  1440 IN$=IN$+L$:GOTO1340
A4  1450 REM ---------- FILENAME -----------
C0  1460 PRINT"[HOME,DOWN,RVSON,BLACK]FILENAME: [[SPC16]][SPC12,UP,RIGHT11]";
A7  1470 FL$=""
A5  1480 GETA$:IFA$=""THEN1480
41  1490 L=LEN(FL$)
E5  1500 IFA$=CHR$(20)ANDL>0THEN 1530
32  1510 IFA$="[CLR]"THEN1460
FD  1520 GOTO1550
1A  1530 FL$=LEFT$(FL$,L-1):PRINT"[LEFT] [LEFT]";
88  1540 GOTO1480
9B  1550 IFA$=CHR$(13)ANDL>0THEN 1610
D8  1560 IFA$=CHR$(32)THEN1580
C3  1570 IFASC(A$)<32ORASC(A$)>90THEN1480
70  1580 IF L=16THEN1480
FD  1590 PRINTA$;
A7  1600 FL$=FL$+A$:GOTO1480
39  1610 FORX=1TOLEN(FL$):POKE832+X,ASC(MID$(FL$,X,1)):NEXT
21  1620 POKE183,L
EA  1630 RETURN
6A  1640 REM ------------ LOAD -------------
E7  1650 GOSUB1970:GOSUB1890:GOSUB1460
2C  1660 IFDV=1THENPRINT"[HOME,DOWN,BLACK,RVSON]  PLACE TAPE IN DECK THEN PRESS 'PLAY' [C5]":GOTO1720
23  1670 PRINT"[HOME,DOWN,BLACK,RVSON] PLACE DISK INTO DRIVE THEN HIT RETURN  [C5]"
F4  1680 POKE198,0:WAIT198,1:GETA$:IFA$<>CHR$(13)THEN1680
F5  1690 PRINT"[HOME,DOWN,BLACK,RVSON]LOADING[SPC33]"
1D  1700 PRINT"[RVSON,UP3,RIGHT8]";FL$
EF  1710 SYS49244:GOTO1730
DD  1720 SYS49152
E5  1730 A=PEEK(829):B=PEEK(830):C=PEEK(831):D=PEEK(832)
AB  1740 SA=(256*B)+A:CA=(256*D)+C:SZ=CA-SA:BU=BU+SZ
DF  1745 DE=CA-1:GOSUB1110:CA$=LEFT$("$0000",5-LEN(HH$))+HH$
52  1750 RETURN
47  1760 REM ------------ SAVE -------------
12  1770 IFCA=SATHENRETURN
69  1780 GOSUB1970:GOSUB1890:GOSUB1460
76  1790 A=SA-INT(SA/256)*256:B=INT(SA/256):POKE829,A:POKE830,B
FB  1795 C=CA-INT(CA/256)*256:D=INT(CA/256):POKE831,C:POKE832,D
20  1797 IFDV<>1THEN1820
D1  1800 PRINT"[HOME,DOWN,BLACK,RVSON]PLACE TAPE IN DECK THEN PRESS 'REC-PLAY'[C5]":SYS49203:SYS49206
97  1810 RETURN
1A  1820 PRINT"[HOME,DOWN,BLACK,RVSON] PLACE DISK INTO DRIVE THEN HIT RETURN  [C5]"
96  1830 POKE198,0:WAIT198,1:GETA$:IFA$<>CHR$(13)THEN1830
BC  1840 PRINT"[HOME,DOWN,BLACK,RVSON]SAVING[SPC34]"
6B  1850 PRINT"[RVSON,UP3,RIGHT7]";FL$
BA  1860 SYS49343
DB  1870 RETURN
E1  1880 REM ---------- TAPE OR DISK -------
7D  1890 PRINT"[HOME,DOWN,BLACK,RVSON]TAPE OR DISK:[SPC27]";
88  1900 IFDV=1THENPRINT"[HOME,DOWN,RIGHT14]TAPE[SPC22]";
72  1910 IFDV=8THENPRINT"[HOME,DOWN,RIGHT14]DISK[SPC22]";
C5  1920 POKE198,0:WAIT198,1:GETA$
A9  1930 IFA$="T"ANDDV=8THENPRINT"[HOME,DOWN,RIGHT14,RVSON]TAPE":DV=1
56  1940 IFA$="D"ANDDV=1THENPRINT"[HOME,DOWN,RIGHT14,RVSON]DISK":DV=8
D8  1950 IFA$=CHR$(13)THENRETURN
D8  1955 IFA$=CHR$(32)THENRETURN
90  1960 GOTO1920
D5  1970 PRINT"[HOME]";:FORA=1TO4:PRINT"[SPC40]";:NEXT
9F  1980 REM ------- PRINT CHECKSUM --------
D1  1990 CH=0:A=KB-B:FORX=1TO8
6E  2000 CH=CH+(X*(PEEK((PC-1)+X))):NEXT
6D  2005 CH=CH+PC
A2  2010 CH=CH-INT(CH/256)*256
8E  2020 DE=CH:GOSUB1110:CH$=MID$(HH$,3):RETURN
E2  2030 REM ------- CHECKSUM ERROR --------
E0  2040 PRINT"[HOME,BLACK,RVSOFF,C@40]";
77  2050 PRINT"[RVSON]INPUT ERROR - RE-ENTER [WHITE]L[BLACK]INE OR [WHITE]C[BLACK]HECKSUM ";
AF  2060 PRINT"[RVSOFF,CT40]"
16  2070 GOSUB2560
5F  2080 GETA$:IFA$=""THEN2080
C2  2090 IFA$="L"THENQQ=1
F6  2100 IFA$="C"THENQQ=2
13  2105 IFA$<>"C"ANDA$<>"L"THEN2080
D7  2160 PRINT"[HOME]";:FORA=1TO3:PRINT"[SPC40]";:NEXT
0C  2170 RETURN
B0  2180 I=49152
A9  2185 PRINT"[CLR,DOWN10,RIGHT7]PLEASE WAIT ONE MOMENT...."
A8  2186 PRINT"[HOME,DOWN11,RIGHT7,CT26]"
AA  2190 READ A:IF A=256 THEN RETURN
EB  2200 POKE I,A:I=I+1:GOTO 2190
B4  2210 DATA 32,44,247,173,60,3,133,255
9C  2220 DATA 169,0,133,193,169,64,133,194
1F  2230 DATA 56,173,63,3,237,61,3,170
23  2240 DATA 173,64,3,237,62,3,168,24
4F  2250 DATA 138,101,193,133,174,152,101,194
DC  2260 DATA 133,175,32,162,245,165,255,141
65  2270 DATA 60,3,96,32,183,247,169,0
DC  2280 DATA 133,193,169,64,133,194,56,173
4A  2290 DATA 63,3,237,61,3,170,173,64
F6  2300 DATA 3,237,62,3,168,24,138,101
02  2310 DATA 193,133,174,152,101,194,133,175
63  2320 DATA 32,124,246,96,169,96,133,185
CA  2330 DATA 169,1,141,60,3,133,184,169
2D  2340 DATA 8,133,186,169,0,133,195,133
0C  2350 DATA 147,169,65,133,187,169,3,133
6C  2360 DATA 188,169,64,133,196,164,183,32
04  2370 DATA 175,245,32,213,243,165,186,32
C4  2380 DATA 9,237,165,185,32,199,237,32
E9  2390 DATA 19,238,141,61,3,32,19,238
23  2400 DATA 141,62,3,32,232,244,165,174
E2  2410 DATA 141,63,3,56,165,175,233,64
6C  2420 DATA 141,64,3,24,173,61,3,109
6A  2430 DATA 63,3,141,63,3,173,62,3
B3  2440 DATA 109,64,3,141,64,3,96,169
0E  2450 DATA 97,133,185,169,1,133,184,169
76  2460 DATA 8,133,186,169,65,133,187,169
81  2470 DATA 3,133,188,165,185,164,183,32
3A  2480 DATA 213,243,32,143,246,165,186,32
BC  2490 DATA 12,237,165,185,32,185,237,169
C8  2500 DATA 0,133,172,169,64,133,173,56
C4  2510 DATA 173,63,3,237,61,3,133,174
21  2520 DATA 173,64,3,237,62,3,133,175
56  2530 DATA 24,169,64,101,175,133,175,173,61,3
1D  2540 DATA 32,221,237,173,62,3,160,0
B1  2550 DATA 32,33,246,96,256
22  2559 REM ********** SOUND ************
D4  2560 POKE 54296,15:POKE 54277,0:POKE 54278,200
78  2570 POKE 54273,40:POKE 54272,00:POKE 54276,17
25  2580 FOR T=1 TO 300:NEXT:POKE 54276,0:POKE 54277,0:POKE 54278,0:RETURN
```

C16 Games

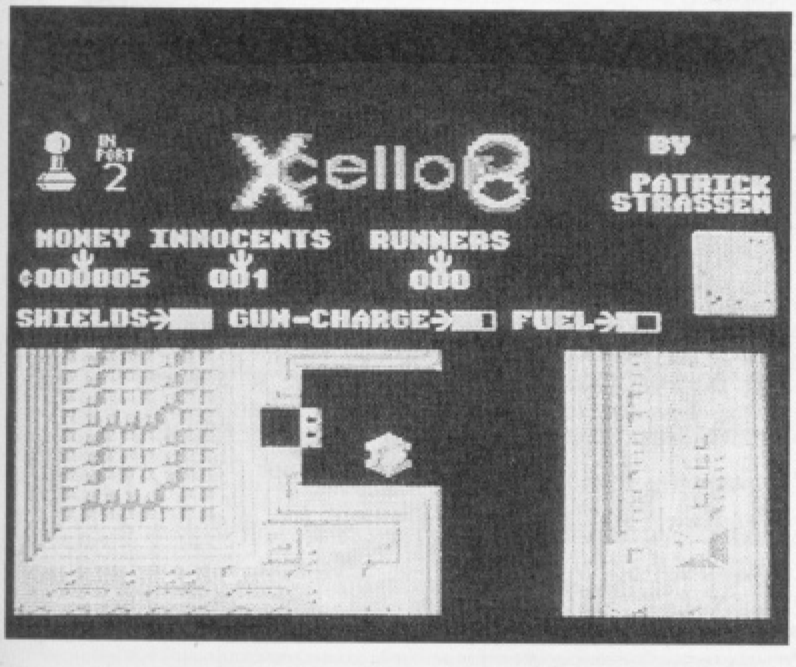
Here's a couple of really worthwhile games for you to get hold of. Especially for the C16 and Plus/4.

By Paul Eves

XCELLOR 8

Xcellor 8 is a fast action, smooth scrolling, multi-screen, kill or be killed type of game for the Plus 4 and C16. Set in the future, you are a modern day bounty hunter. Your task is to search the streets for criminals, known as the runners. Once found, you must shoot them down and capture them. Once you've captured your prey, you may exchange him/her/it for credits at the bank. Having accumulated some money, you may buy extra equipment for your craft. Better shields, mines, detectors etc. The game starts outside the city bank.

Press fire on the joystick and select your speed, using the function keys. F1 is slowest and HELP key is fastest. You are now ready to patrol the area looking for the runners. Once you have hit a handful of runners, (on the first level, you only need hit them once to capture them), take them to the bank to collect your reward. Inside the bank, you will see three long queues of droids waiting to be served. The idea is to get to the front of the queue as quickly as possible. You achieve this by pressing the fire button repeatedly. If your queue is moving slowly, move the stick up and down to change queues. The longer you are in the queue, the less you will get for each runner, so speed is essential.



Having now gained some money, you may go to the shop to buy some extra supplies. Select the item you want by moving the joystick, and press fire to buy the item required. To leave the shop you must press CONTROL.

One thing to look out for are the innocent droids. These little creatures turn up everywhere. If you should hit one of these droids, you must take it to hospital for repair. Therefore you are wasting valuable time. To add to your troubles, you must have enough money to pay for the repair also. Should you be unfortunate to hit three of these droids, the game ends.

To help you in your task, you are fitted with a scanner which tells you where everyone is. Keep a watchful eye on it.

I was fairly well impressed with this game. The graphics are the standard BAS relief type. The scrolling was nice and smooth, with no apparent chinks. There must be getting on for 30 to 40 screens worth of playing area. This makes for an exciting game all told.

Touchline

Title: *Xcellor 8,* ***Company:*** *Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield, S1 4FS.* ***Machine:*** *C16.* ***Price:*** *£7.95.*

Originality: *6/10.* ***Playability:*** *7/10.* ***Graphics:*** *7/10.* ***Value:*** *8/10.*

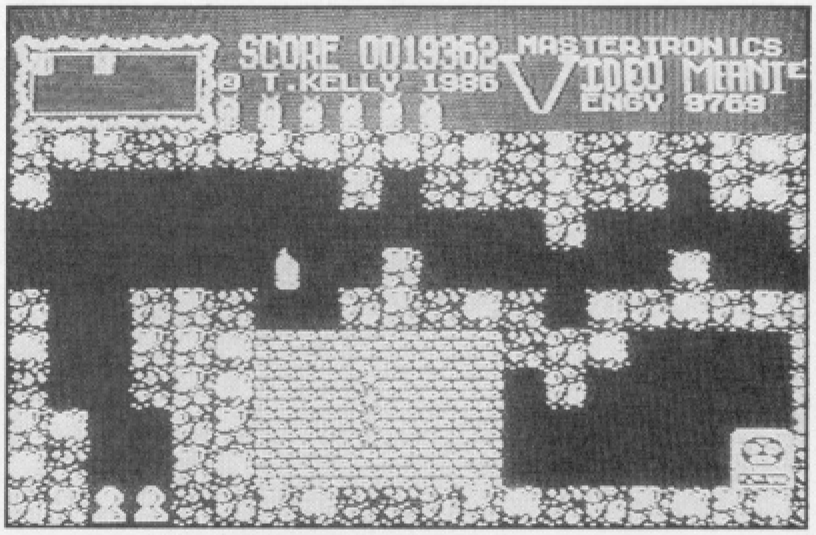
Video Meanies

Video Meanies has you running around all kinds of caves and rooms in an attempt to turn off TVs. As usual you have all sorts of flying horrors preventing you doing this. For the most part, these present little or no impedence to your quest. Obviously, there there are the rather stubborn type that just will not give up (just perservere).

Before I go any further, let me just say that I would suggest you make a map of your travels. There appears to be quite a number of caverns/rooms to visit. And there is it seems, more than one way of going about it. As well as turning off the TV sets, there are a number of keys to collect. These keys unlock routes, which would otherwise be closed to you.

So how do you get around? Some of the caverns are simply in at one end, avoid the nasties, turn off the set, collect the key if there is one, then out at the other end. No dead ends, no trouble. Others on the other hand, are a different kettle of fish. At first it appears there is no entry and no exit. The idea being to blast your way through connecting walls, floors etc. It is this aspect of the game, which for me, made it very enjoyable to play. The programmer has put quite a lot of thought into the screen layouts, and I would like to congratulate him on his fiendishness. A word of warning here. It is OK to touch the small rectangular bricks, but avoid virtually everything else on the screen.

The sound effects are quite good overall, and for me, the graphics are very good indeed. (I've always liked this type of graphics on my 64). I find that this is one of those games you just have to keep playing, just to beat your previous score.



Touchline

Title: *Video Meanies.* ***Company:*** *Mastertronic, 8-10 Paul Street, London EC2A 4JH.* ***Price:*** *£1.99.* ***Machine:*** *C16/Plus/4.*
Originality: *7/10.* ***Playability:*** *8/10.* ***Graphics:*** *8/10.* ***Value:*** *10/10.*

USA Today

Your Commodore's US correspondent reports on the CBM scene from his hideaway in Parrott, Georgia.

By Lewis Tilley

The uneducated youth of America is being quietly seduced by the computer. Lured into learning by programs they play as games. Students find themselves raising their scholastic scores higher than their non-computer orientated fellows.

Worst software offenders are historical simulations such as *Colonial Conquest* which lays the foundation for understanding some of the third world problems of today and *Rails West!* which probes the pinpointed area of the US's development of its railway systems. Both of these games, developed around real periods of history, are published by Strategic Simulations, Inc. Cost is $40 plus postage and handling.

Seven Cities of Gold by Electronic Arts doesn't merely duplicate American history but puts the student into the boots of conquistadores to discover how the Americas were taken over in the 17th century, (available in the UK from Ariolasoft).

Recent history can be cribbed from the flood of war games which now include *Battlegroup*, a companion of *Kampfgruppe* in the fighting of World War II. Both are from Strategic Simulations. *Europe Ablaze* which is the bombers' war in Europe, is by Strategic Studies Group.

Older wars are remembered in Games Designer's Workshop's *Battle of Chickamauga* for $35 and Strategic Simulations' *Battle of Antietam* both of which detail crucial battles in the American Civil War (or "Tha Wah between tha States", as we of the South prefer to call it'.

The parents of the young US child have become involved in this educational scheme. They raise money with such projects as "garage sales" and "second hand" shops, neither of which sell either garages or second hands. In order to supply the school rooms of America with computers. Unfortunately, these computers are usually Apples, not Commodores, but some states (North Carolina for one) are introducing an extensive use of 64s in their school art lessons.

One national magazine, *Family Computing*, is devoted almost exclusively to the use of computers in education. Its owners are the prestigious Scholastic Inc. long a publisher of books and magazines for school children. They now publish educational software as well. The *Stickybear* Software series is highly praised by educators across the country. *Town Builder* is one of the newest. It "teaches spatial relations and basic map skills" to the five to nine age group. *Car Builder* is for the older child but is also published by Weekly Reader Family Software which is the name of Scholastic's software division.

S.A.T. does not abbreviate Saturday in the US. It stands for Scholastic Aptitude Test. It is a multiple choice test which our colleges use to predict performance of potential students. A high score helps a graduating high school (secondary school) student gain admittance to their choice of colleges. Naturally, the software companies of the US supply tutoring programs for the S.A.T. More than a dozen were reviewed in Family Computing recently. You might like to test yourself against the American level of secondary school education with one of these. *Mastering the SAT* was written by educators from the National Association of Secondary School Principals and is published by CBS Software and costs $80. You think that's expensive? You could pay as much as £250 for *Owlcat SAT Preparatory Course*, a 60-hour program from Digital Research. We take these things very seriously over here! Even our potential athletes are screened before they start their college careers by the Scholastic Aptitude Tests. "No pass SAT, no play football or basket ball first year in college."

Now, on to happier news. In the opinion of many, Commodore has it made. Well, maybe the Amiga isn't selling as fast as Commodore needs in order to assure a fat profit, and the Apple GS (the GS stands for GRAPHICS AND SOUND) is taking the Amiga on in the market place. But, from here at the end of 1986, it looks like Commodore is going to be around a long, long time.

Why does our old Faithful continue to flourish in spite of adversity? Software is why. First time buyers of computers are always advised to "Choose the software, then pick a computer within your budget that will run it."

GEOS is the easiest operating system yet devised for the beginner. Two new *GEOS* disks have been added to the system this month by Berkely Softworks and more are promised by other programmers. The two new ones are *FontPack* which adds 20 new type faces or "fonts" to geoWrite, the word processor, the *Desk Pack*. The latter is a four in one applications pack. Art Grabber gives access to the artwork you create using *Print Shop*, *Print Master* and *Newsroom*. Calender may be called upon when needed. Icon Editoyou "customize your *GEOS*file icons with the graphic of your choice. For good measure the creators of GEOS throw in a souped up Black Jack icon/card game. You may order *Font Pack* for $29.95, Desk Pack for $34.95. Add $5.50 for overseas shipping and handling and wait at least six weeks. YC

Touchline

Strategic Simulations: *1046 N. Rengstorff Ave, Mountain View, Ca 94043.* ***Strategic Studies Group:*** *1747 Orleans Court, Walnut Creek, Ca 94598.* ***Ariolasoft:*** *68 Long Acre, Covent Garden, London WC2E 9JH. Tel: 01 836 3411.* ***Berkley Softworks:*** *PO Box 57135, Hayward, Ca 94545.*

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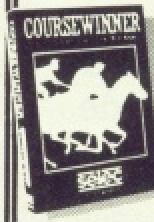
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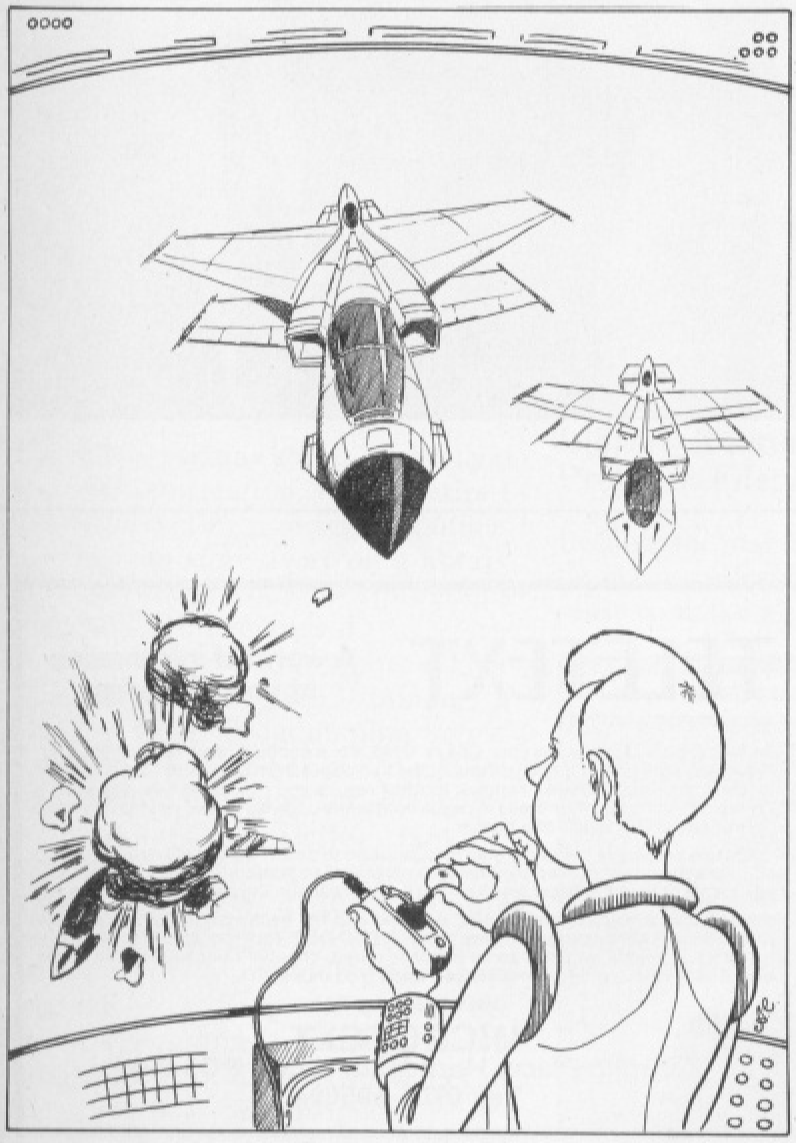
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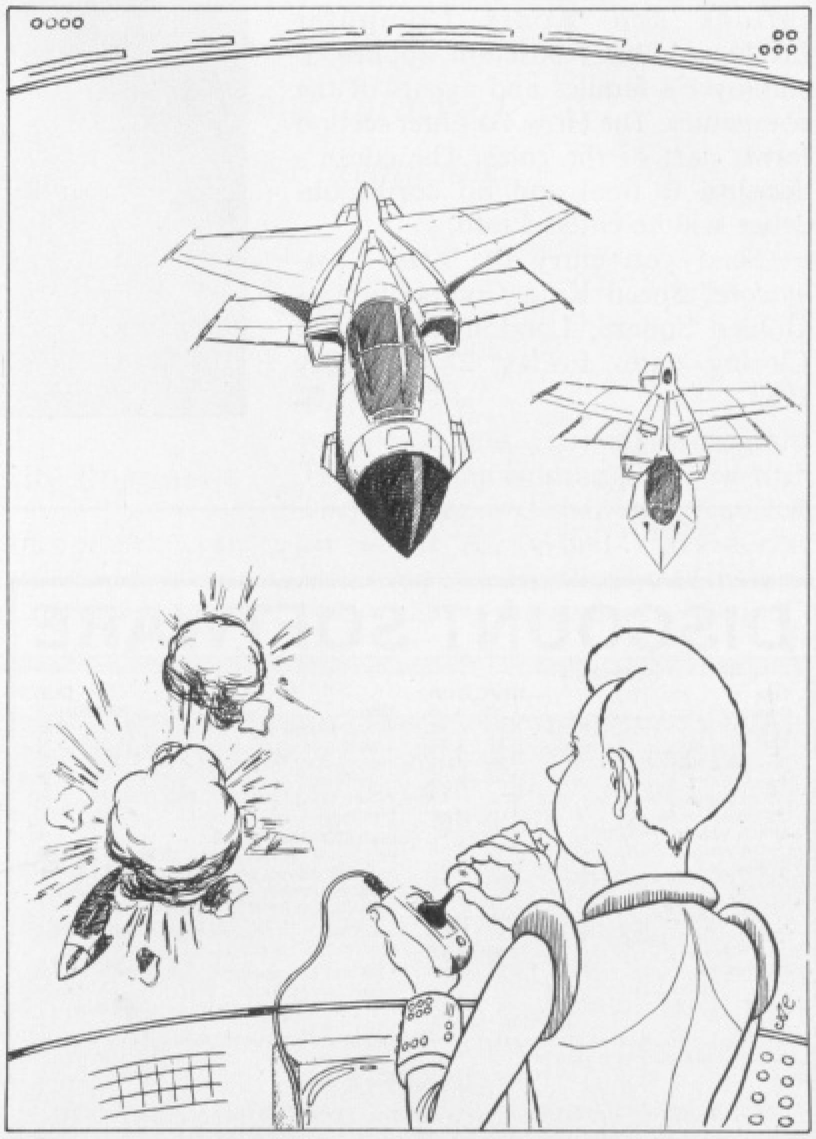
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The *Speed King* joystick has been well tested by *Your Commodore*. At a recent party in the Video Cafe, in London's West End, our editorial assistant, Stuart Kirkham beat all comers in a Daley Thomson's Decathlon high score competition and walked off with a weekend for two in Amsterdam courtesy of Konix, whose joystick had helped him to his 58,584 point victory. Our pic shows Stuart (the staunch Westham supporter on the left) and Wyn Holloway, Konix's MD. The only question remaining is which of the editorial staff will be going on holiday with him? (The editor's decision is final!)

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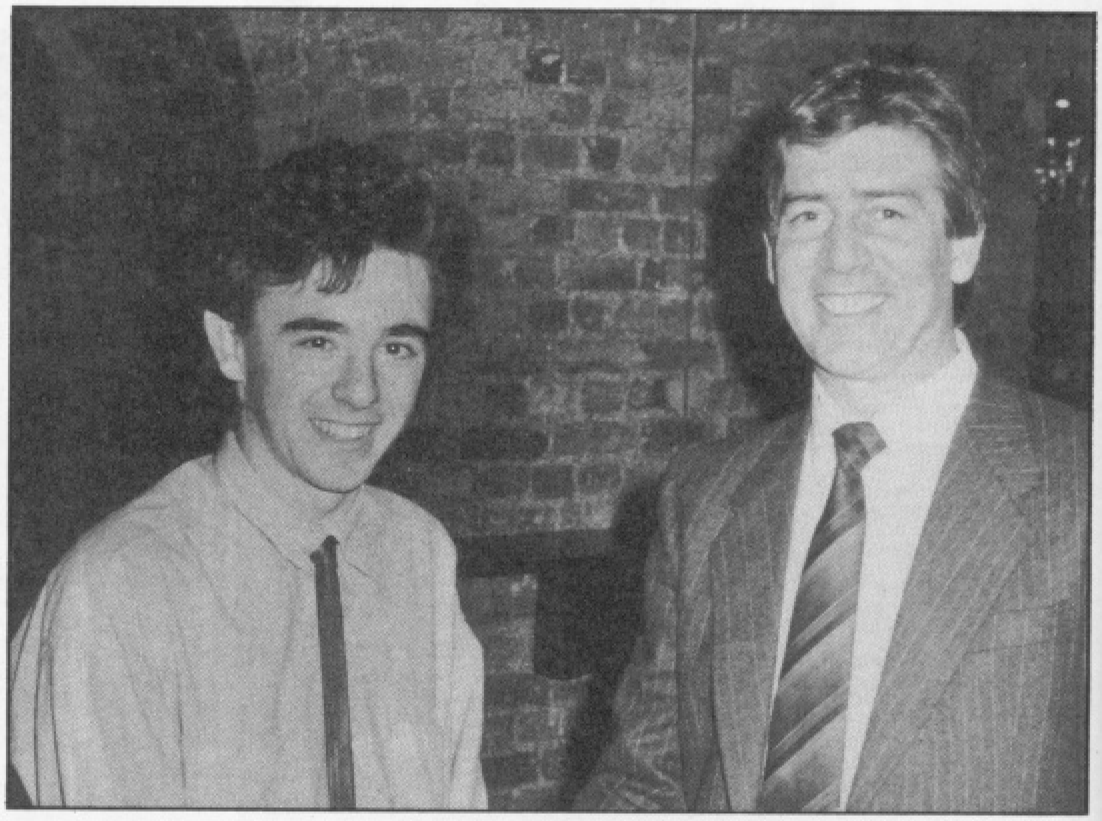
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Machine Code Library

If you need to find something in a book then you go to a library. In this new series we will give you a library of Machine Code routines that will prove to be invaluable.

By Paul Eves

A library of any sort is an excellent source of information. In this series I will be presenting a series of routines that you can store away on a library disk and use in your own programs when occasion demands it.

Over the last few months *Your Commodore* has been running a Machine Code Programming series. Now that the series has ended a lot of you will be looking for ideas for programs and wondering how to implement your new found knowledge. The routines in this series are intended to show you how to achieve certain tasks, from adding numbers together to moving sprites on the screen. The routines will build up to an invaluable set of utilities that you can use within your own programs.

All of the programs will be presented in the form of an assembly language program together with comments. Following the program through and reading the comments will show you just how the program works. I have used the *Commodore Macro Assembler* to enter these programs and most of the commands will be common to all good assemblers.

This month I am presenting two utilities. The first one is a Directory Displayer which will produce a listing of a disk in the dirve on the screen without affecting the program currently in memory. The second is a sprite aid and makes things such as altering sprite priorities in machine code much easier.

Library Routine: 1
Program File: Sprite Routines

Because the maintenance of sprites can be a very repetive business, it makes sense to make all the routines as subroutines within your main program. The following routine does just that. The only parameters that are required, are for the 'A', 'X' and 'Y' registers to have the required value stored in them, before calling the respective routine.

```
PROGRAM: SPRITE ROUTINES

1000          ;SPRITE MAINTENANCE S/R
1010          ;A,X & Y REGISTERS NEED
1020          ;REQUIRED VALUES IN THEM
1030          ;BEFORE CALLING EACH
1040          ;ROUTINE
1050          ;
1060          ;
1070         *=$C000 ;OR WHERE YOU LIKE
1080          ;
1090          ;
1100          ;
1110 SPTBLK = $07F8 ;SPRITE BLOCK NUMBER
1120 SPENAB = $D015 ;SPRITE ENABLE REG
1130 SPXPOS = $D000 ;SPRITE HORIZ POS
1140 SPYEXP = $D017 ;SPRITE VERT EXPAND
1150 SPXEXP = $D01D ;SPRITE HORIZ EXPAND
1160 SPBPRI = $D01B ;SPRITE PRIORITY REG
1170 SPMULT = $D01C ;MULTICOLOUR REG
1180 SPSCOL = $D01E ;SPR-SPR COLLISION
1190 SPBCOL = $D01F ;SPR-CHAR COLLISION
1200 SPMUL1 = $D025 ;SPRITE MULT COLOR1
1210 SPMUL2 = $D026 ;SPRITE MULT COLOR2
1220 SPCOL  = $D027 ; UPTO $D02E,SPRTCOL
1230 IRQFLG = $D019
1240          ;
1250          ;SPRITE ON (A=SPTNUMBER(S))
1260          ;
1270 SPTON  ORA SPENAB
1280        STA SPYEXP
1290        RTS
1300          ;
1310          ;SPRITE OFF (A=SPTNUMBER(S))
1320          ;
1330 SPTOFF EOR #$FF
1340        AND SPENAB
1350        STA SPENAB
1360        RTS
1370          ;
1380          ;EXPAND X (A=SPTNUMBER(S))
1390          ;
1400 EXPANX ORA SPXEXP
1410        STA SPXEXP
1420        RTS
1430          ;
1440          ;SHRINK X (A=SPTNUMBER(S))
1450          ;
1460 SHRINX EOR #$FF
1470        AND SPXEXP
1480        STA SPXEXP
1490        RTS
1500          ;
1510          ;
1520          ;EXPAND Y (A=SPTNUMBER(S))
1530          ;
1540 EXPANY ORA SPYEXP
1550        STA SPYEXP
1560        RTS
1570          ;
1580          ;SHRINK Y (A=SPTNUMBER(S))
1590          ;
1600 SHRINY EOR #$FF
1610        AND SPYEXP
1620        STA SPYEXP
1630        RTS
1640          ;
1650          ;POINTER (A=FRAME:X=SPRT)
1660          ;
1670 SPRPIR STA SPTBLK,X
1680        RTS
1690          ;
1700          ;POSITION(X=NO/A=HORI/Y=VER)
1710          ;
1720 POSIT  PHA
1730        TXA
1740        ASL A
1750        TAX
1760        PLA
1770        STA SPXPOS,X
1780        INX
1790        TYA
1800        STA SPXPOS,X
1810        RTS
1820          ;
1830          ;MULTIC-ON (A = SPRT NO'S.)
1840          ;
1850        MCON ORA SPMULT
1860        STA SPMULT
1870        RTS
1880          ;
1890          ;MULTIC-OFF (A = SPRT NO'S.)
1900          ;
1910 MCOFF  EOR #$FF
1920        AND SPMULT
1930        STA SPMULT
1940        RTS
1950          ;
1960          ;COLOR (A=COLOUR/X=NO.)
1970          ;
1980 COLOR  STA SPCOL,X
1990        RTS
2000          ;
2010          ;MCCOL (X=MULT1 / Y=MULT2)
2020          ;
2030 MCCOL  STX SPMUL1
```

```
2040        STY SPMUL2
2050        RTS
2060        ;
2070        ;PRIORITY ON (A=NO'S.)
2080        ;
2090 PRION  ORA SPBPRI
2100        STA SPBPRI
2110        RTS
2120        ;
2130        ;PRIORITY OFF (A=NO'S)
2140        ;
2150 PROFF  EOR #$FF
2160        AND SPBPRI
2170        STA SPBPRI
2180        RTS
2190        ;
2200        ;
2210 .END
```

Library Routine:2
Program File: Read Directory

The following routine allows the Directory to be read, without loading it into the computer's memory. The routine can be called from within a program, or can be used as a stand alone routine.

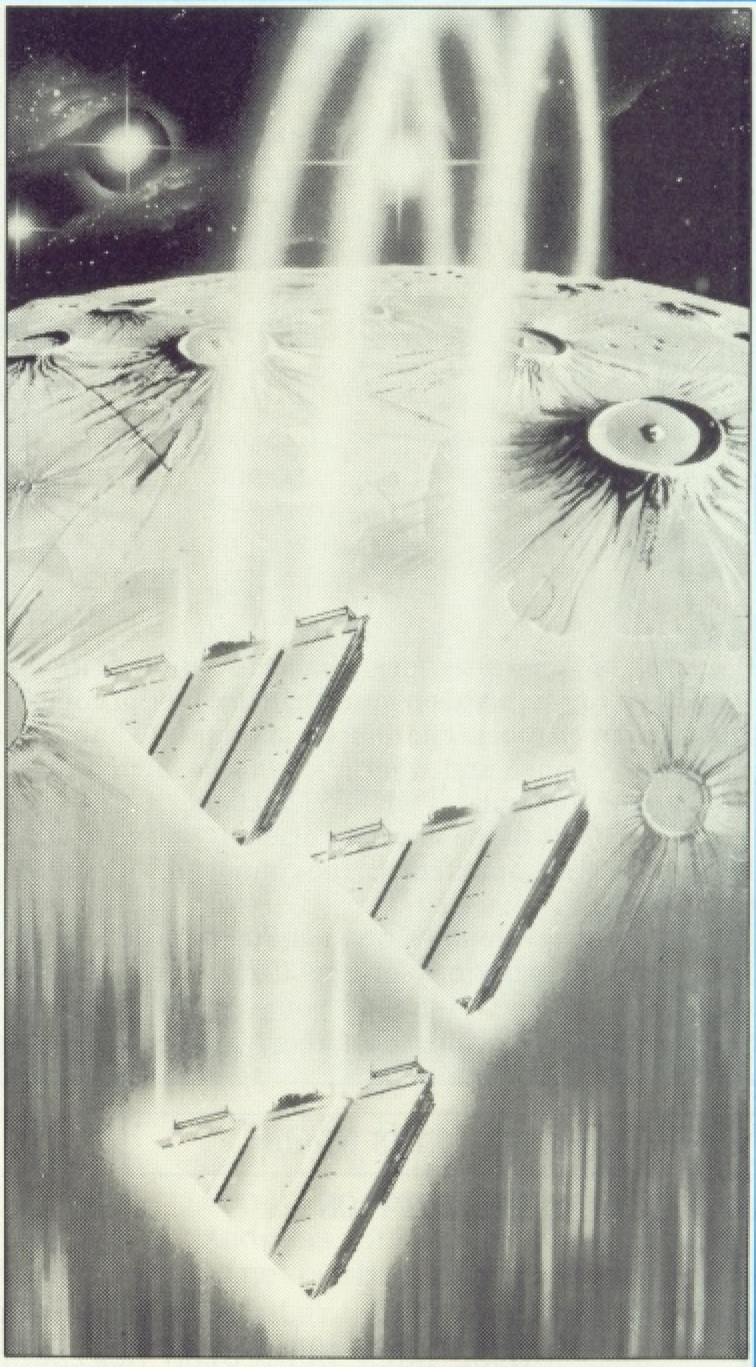
```
PROGRAM: DIRECTORY

1000 ;
1010 ;LIST DIRECTORY TO SCREEN WITHOUT
1020 ;DISTURBING PROGRAM IN MEMORY
1030 ;
1040 ;
1050 *       = $C820 ;OR WHERE YOU LIKE
1060 FACOUT  = $BDCD ;OUTPUT POS INTERGER
1070 IECBUS  = $F305 ;OPEN FILE ON IECBUS
1080 DIRFIN  = $F642 ;UNLISTEN AND CLOSE
1090 TKSA    = $FF96 ;SECADD FOR TALK DEV
1100 ACPTR   = $FFA5 ;GET DATA FROM S-BUS
1110 UNTALK  = $FFAB ;STOP TALKING
1120 CHROUT  = $FFD2 ;OUTPUT CHAR TO CHAN
1130 TALK    = $FFB4 ;CMD DEV TO TALK
1140 TEMP1   = $FB ;TEMPORY STORE
1150 TEMP2   = $FC ;TEMPORY STORE
1160 TEMP3   = $FD ;TEMPORY STORE
1170 FNADR1  = $BB ;HI-PTR CURRENT FILE
1180 FNADR2  = $BC ;LO-PTR CURRENT FILE
1190 FNLEN   = $B7 ;LENGTH CURRENT FILE
1200 LSTX    = $C5 ;CURRENT KEY PRESSED
1210 ST      = $90 ;STATUS WORD
1220 FA      = $BA ;CURRENT DEV NUMBER
1230 SA      = $B9 ;CURRENT SECADDR
1240 ;
1250 ;
1260 ;
1270 ;
1280 ;
1290 DIRECT LDA #$93
1300        JSR CHROUT
1310        LDA #$30
1320        STA TEMP2
1330        LDA #$02
1340        STA TEMP3
1350        LDA #$00
1360        STA ST
1370        LDA #$24
1380        STA TEMP1
1390        LDA #$F8
1400        STA FNADR1
1410        LDA #$00
1420        STA FNADR2
1430        LDA TEMP3
1440        STA FNLEN
1450        LDA #$08
1460        STA FA
1470        LDA #$60
1480        STA SA
1490        JSR IECBUS
1500        LDA FA
1510        JSR TALK
1520        LDA SA
1530        JSR TKSA
1540        LDY ST
1550        BNE FINIS
1560        LDY #$06
1570 STOREY STY TEMP1
1580        JSR ACPTR
1590        LDX TEMP2
1600        STA TEMP2
1610        LDY ST
1620        BNE FINIS
1630        LDY TEMP1
1640        DEY
1650        BNE STOREY
1660        LDY TEMP2
1670        JSR FACOUT
1680        LDA #$20
1690        JSR CHROUT
1700 ACPT   JSR ACPTR
1710        LDX ST
1720        BNE FINIS
1730        TAX
1740        BEQ NXTLIN
1750        JSR CHROUT
1760        JMP ACPT
1770 NXTLIN LDA #$0D
1780        JSR CHROUT
1790        LDA LSTX
1800        CMP #$3F
1810        BEQ FINIS
1820        LDY #$04
1830        BNE STOREY
1840 FINIS  JSR DIRFIN
1850 ;
1860 ;YOU CAN FINISH HERE WITH A RTS OR
1870 ;CARRY ON AND READ ERROR CHANNEL
1880 ;
1890 DERROR LDA #$0D
1900        JSR CHROUT
1910        LDA #$00
1920        STA ST
1930        LDA #$08
1940        STA FA
1950        JSR TALK
1960        LDA #$6F
1970        STA SA
1980        JSR TKSA
1990 ERRIN  LDY ST
2000        BNE ENDIT
2010        JSR ACPTR
2020        JSR CHROUT
2030        CMP #$0D
2040        BNE ERRIN
2050 ENDIT  JSR UNTALK
2060        RTS
```

Scorching ideas from Hi-Tech Trilogic made specially for your **Commodore 64/128**

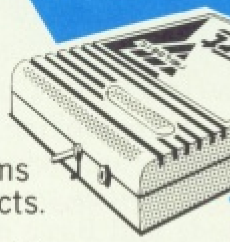
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Bare Facts

A detailed knowledge of your computer is important when writing or translating programs. We provide memory maps of all the popular Commodore computers to help you.

Many of the programs that are printed in *Your Commodore* can be used on more than one type of computer with just a few changes. The important thing is to know what you need to change and what it should be altered to. For axample the command POKE 53280,0 on a C64 would change the colour of the screen to black. If you were using a C16 or C128 you could replace the command with COLOR 3,0.

Over the next few months we will be taking a detailed look at the internal workings of the Commodore range of computers. This way, should you wish to translate a program from one machine to another, you should be able to find what you are looking for.

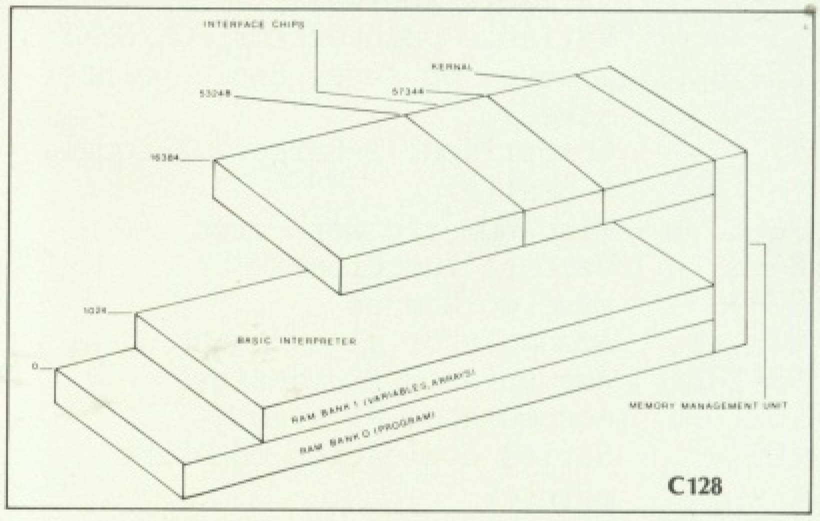
This month we are taking a look at the zero page memory maps of the various computers. This should help both machine code and Basic programmers find out just what those ever present POKES do. The memory maps aren't complete. What is provided is a list of the memory locations that you will probably come across in your everyday Basic and Machine code programming.

In future issues we will be taking a look at the graphics and sould chips and providing memory maps for all of the popular Commodore micros. YC

Commodore 128 (C128 Mode)

LOCATION	DESCRIPTION
ALL BANKS	
0	8502 Data Direction Register
1	8502 Data I/O Register
2-4	SYS address argument
5-9	SYS register save area
15	Data type: FF=string, 00=numeric
16	Data type: 00=floating point, 80=integer
21	Current I/O prompt flag
22-23	Integer value
45-46	Pointer: start of Basic (bank 0)
47-48	Pointer: start of variables (bank 1)
49-50	Pointer: start of arrays
51-52	Pointer: end of arrays
53-54	Pointer: string storage
57-58	Pointer: limit of memory (bank 1)
59-60	Basic line number
61-62	Position in Basic line
65-66	Line number of current DATA statement
67-68	Address of current DATA
71-72	Variable name
73-74	Variable address
99	Accumulator #1: Exponent
100-103	Accumumator #1: Mantissa
104	Accumulator #1: Sign
106-111	Accumulator #2: Exponent etc.
112	Sign comparison, Acc#1 & Acc#2
113	Accumulator #1 low-order (rounding)
125-126	Basic pseudo-stack pointer
144	Status Variable ST
145	STOP and RVS flags
152	Number of open files
153	Default input device (0)
154	Default output device (3)
157	Flag: Messages 192=all messages, 64=errors only, 0=none
160-162	Jiffy Clock
174-175	Tape end address / End of program
183	Characters in file name
184	Logical file number
185	Secondary address

186	Device number
187-188	Pointer: Filename
208	Number of characters in keyboard buffer
209	Flag: Function key
210	Pointer: Function key string
211	Flag: 0=no shift, 1=shift, 2=Commodore, 4=Control, 16=ALT
212	Current key
213	Last key 88 if no key
215	Flag: 40 or 80 columns - 0=40 col
217	Character set - 0=ROM, 4=RAM
224-225	Pointer: Text screen line
226-227	Pointer: Colour screen line
228-231	Values of window: Bottom, Top, Left, Right
232-234	Input location: column start, line start, line end
235	Cursor position on line
236	Cursor position on row
237	Max number of screen lines
238	Max number of screen columns
241	Character colour
243	Flag: Reverse
244	Flag: Quote mode
245	Flag: Insert mode
250-255	FREE SPACE
512-600	Basic input buffer
674-686	PEEK any bank routine
687-701	POKE any bank routine
702-716	Compare any bank routine
717-738	JSR to another bank
739-763	JMP to another bank
780-781	Vector: Crunch
782-783	Vector: LIST
784-785	Vector: Execute
786-787	UNUSED
788-789	Vector: IRQ
790-791	Vector: Break
792-793	Vector: NMI
794-795	Vector: OPEN
796-797	Vector: CLOSE
798-799	Vector: CHKIN
800-801	Vector: CHKOUT
802-803	Vector: CLRCHN
804-805	Vector: CHRIN
806-807	Vector: CHROUT
808-809	Vector: STOP
810-811	Vector: GETIN
812-813	Vector: CLALL
814-815	Vector:USR vector
816-817	Vector: LOAD
818-819	Vector: SAVE
842-851	Keyboard buffer
866-875	Logical file table
876-885	Device number table
886-895	Secondary address table
896	CHRGET routine
902	CHRGOT routine
927-938	Subroutines to fetch from RAM banks
991	Accumulator #1 overflow
65280	MMU configuration register
65281-84	MMU load configuration register
BANK 0 (Basic programs)	
1024-2023	40 column screen memory
2048-2559	Basic run time stack
2592	Size of keyboard buffer
2594	Flag: Key repeat: 128=all, 64=none
2595	Delay for repeat
2596	Delay before repeat starts
2598	40 column cursor mode - blink or solid
2603	80 column cursor mode
2604	Pointer: start of screen memory/ character data
2605	Pointer: start of high res screen
2607	Pointer: start of 80 column screen
2608	Pointer: start of colour screen for 80 column
2816-3007	Cassette buffer
4096-4106	Length of function key strings
4107-4351	Function key strings
4616	Address of error variable ER
4617-4618	Line number of error (EL)
4624-4625	Pointer: End of Basic program in bank 0
4626-4627	Pointer: maximum Basic program space in bank 0
4632-4634	USR program jump
4635-4639	RND seed value

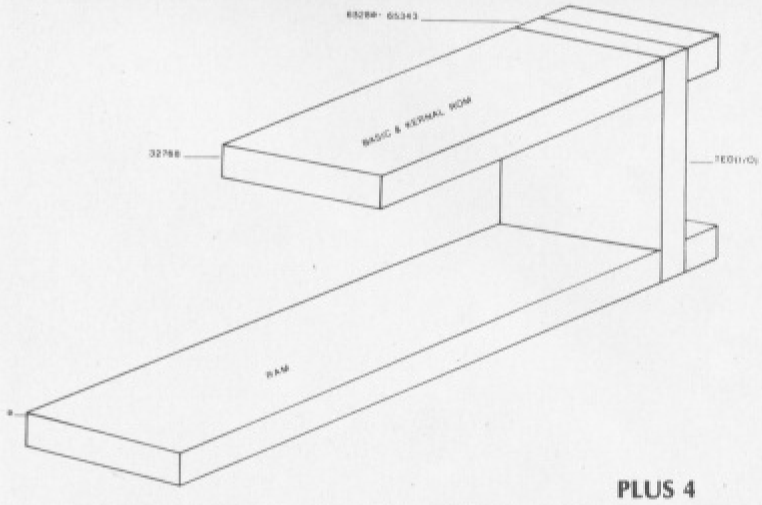


C128

Plus/4

0	7501 Data direction register
1	7501 8 bit I/O port (as 64)
3-4	New start address (RENUMBER)
5-6	Step width (RENUMBER)
7	Search character
8	Flag: Searching for quote
9	Screen column from last TAB
10	Flag: 0=LOAD, 1=VERIFY
11	Input buffer counter, No.of elements
13	Flag: FF=string, 00=numeric
14	Flag: FF=integer, 00=floating point
15	Flag: Data scan/ LIST quote/ memory flag
16	Flag: User function Call
17	Flag: 00=INPUT, 40=GET,98= READ
20-21	Integer value
22	Pointer:Temporary string stack
23-24	Vector: Last temporary string
25-33	Temporary string stack
34-37	Utility pointer area
38-42	Product area for multiplication
43-44	Pointer: Start of Basic
45-46	Pointer: Start of Basic variables
47-48	Pointer: Start of Basic arrays
49-50	Pointer: End of arrays
51-52	Pointer: Start of strings
53-54	Pointer: Current string
55-56	Pointer: Top of Basic memory
57-58	Current Basic line number
59-60	Previous Basic line number
61-62	Pointer: CONT Basic line number
63-64	Current DATA line number
65-66	Pointer: Current DATA address
67-68	Vector: INPUT routine
69-70	Current variable name
71-72	Variable address
73-74	Variable pointer for FOR/NEXT
75-76	Y save, op save, Basic pointer save
77	Comparison: 1=Larger, 2=Equal, 4=Smaller
78-83	Misc numeric work area
84-86	Vector: functions
87-96	Misc work area
97	Accumulator #1 exponent
98-101	Accumulator #1 mantissa
102	Accumulator #1 sign
103	Series evaluation constant pointer
104	Accumulator #1 Hi-order overflow
105-110	Accumulator #2 as for #1
111	Accumulator sign comparison
112	Accumulator #1 rounding
113-114	Pointer: Cassette buffer
115-116	Flag: AUTO command, 0=OFF
117	Flag: 1= 10K reserved for graphics
124-125	Pointer: GOSUB stack
131	Current graphics mode:00=text, 20=Hires,60=split hires,A0= multicolour,E0=split-multicolour
132	Current colour
133	Multi-colour 1
134	Foreground colour
135	Max number of columns
136	Max number of rows
144	Status word ST
145	Flag: STOP and RVS keys
147	Flag: 0=LOAD, 1=VERIFY
148	Flag: Character in serial buffer 00=no, 80=yes
149	Character in buffer for serial address
151	Number of files open
152	Default input device
153	Default output device
154	Flag:80=Direct mode,C0=monitor 00=program
157-158	Pointer:Tape end/Program end
163-165	Jiffy clock
171	Length of filename
172	Logical file number
173	Secondary address
174	Device number
175-176	Pointer: Filename
178-179	I/O start address
180-181	Basic loading address
182-183	Pointer: Load end address for tape
194	Flag: RVS (12=Yes,00=No)
196-197	Cursor position (x,y)
198	Flag: Key pressed : 40=none
199	Input from screen/keyboard
200-201	Pointer: screen line
202	Pointer: Screen column
203	Flag: 0=not in quote mode
204	Length of current screen line
205	Pointer: cursor row
206	Output character to screen
207	Flag: Insert mode: >0=number of inserts
234-235	Pointer:Current screen colour
236-238	Vector to keyboard decode
239	No. of characters in keyboard buffer

248	Type of tape file
249	bit7=1:Write, bit6=1:Read
275-289	Colour luminence table in RAM
291-511	Processor stack
512-600	Basic input buffer
601-602	Previous Basic line number
603-604	Pointer: Basic statement for CONT
754-755	Pointer:Float to fixed routine
756-757	Pointer: Fixed to integer
768-769	Vector: Basic error messages
770-771	Vector: Basic warm start
772-773	Vector: Basic token generator
774-775	Vector: Basic LIST
776-777	Vector: Basic command execute
778-779	Vector: Basic token evaluate
780-781	Vector: Basic user token evaluation
782-783	Vector: Create Keyword
784-785	Vector: Prepare user token
786-787	Vector: Interrupt
788-789	Vector: Hardware interrupt
790-791	Vector: BRK interrupt
792-793	Vector: Kernal OPEN
794-795	Vector: CLOSE
796-797	Vector: CHKIN
798-799	Vector: CHKOUT
800-801	Vector: CLRCHN
802-803	Vector: CHRIN
804-805	Vector: CHROUT
806-807	Vector: STOP
808-809	Vector: GETIN
810-811	Vector: CLALL
812-813	Vector: Monitor break
814-815	Vector: LOAD
816-817	Vector: SAVE
818-1010	Tape buffer
1139-1144	CHARGET subroutine
1145-1156	CHRGOT subroutine
1263	Last error number
1264-1265	Row number of last error
1266-1267	Reference for ON ERROR GOTO
1280	USR jump command
1281-1282	USR address (low/high)
1283	RND seed value
1289-1298	Table of logical file numbers
1299-1308	Table of device numbers
1309-1318	Table of secondary addresses
1319-1328	Keyboard buffer
1329-1330	Start address of RAM for OS
1331-1332	Pointer: End of RAM operating system
1339	Current colour code Bit 7 : 1=flash 6-4 : luminance (0-7) 3-0 : colour (0-15)
1343	Size of keyboard buffer
1344	Flag: Key repeat :80=all,40= none,00=DEL,space,cursors
1345	Repeat speed
1346	Repeat delay counter
1347	FLAG: shift,CTRL,CBM key
1348	last pattern of shift
1349-1350	Pointer: keyboard table setup
1351	Flag: SHIFT 80=no, 00=yes
1362	Program counter high
1363	Program counter low
1364	Processor flags
1365	Processor A reg
1366	Processor X reg
1367	Processor Y reg
1368	Processor stack pointer
2038	Current Key pressed



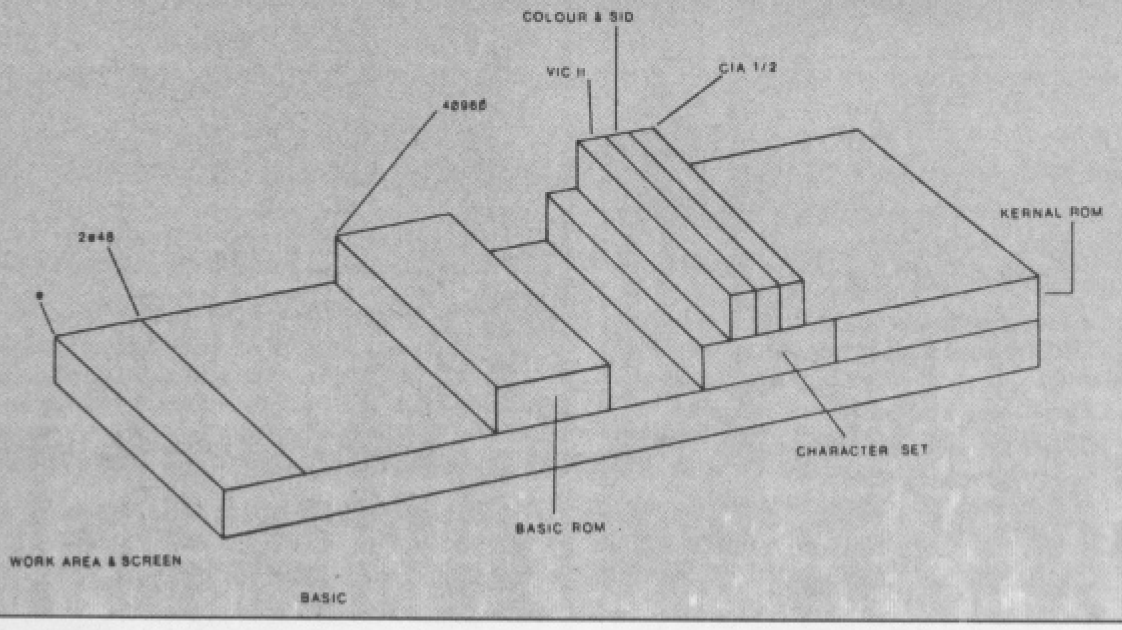
PLUS 4

Commodore 64 & C128 in C64 Mode

LOCATION	DESCRIPTION
0	6510 On-chip Data Direction Register
1	6510 On-chip 8-bit input/output register. Bit No: 0 LOWRAM signal (0=BASIC ROM OUT) 1 HIRAM signal (0=KERNAL ROM OUT) 2 CHAREN signal (0=CHARACTER ROM IN) 3 Cassette data output line 4 Cassette switch sense (1=switch closed) 5 Cassette motor control (1=ON, 0=OFF) 6 and 7 unused
2	Unused
3-4	Jump vector: Convert Floating point numbers to Integer.
5-6	Jump Vector:Convert Integer-Floating
7	Search Character (34) quote
8	Flag:Scan for quote at end of string

9	Screen column from last TAB
10	FLAG: 0=LOAD, 1=VERIFY
11	Input buffer pointer/Number of subscripts.
12	FLAG: Default array dimension - Holds value of letter of most recent dimensoned array.
13	Data type: 255=String, 0=Numeric
14	Data type: 128=Integer, 0=Floating point
15	Flag: DATA scan/ LIST quote/ Garbage call
16	Flag: Subscript ref/ User function call
17	FLAG: 0=INPUT, 64=GET, 152=READ
18	Flag: TAN sign/ Comparison result
19	Flag: INPUT prompt
20-21	Temp: Integer value
22	Pointer: Temporary String Stack
23-24	Last temp string address
25-33	Stack for temporary strings
34-37	Addresses stored here point to machine code routines in Basic ROM
38-42	Floating point product of multiply
43-44	Pointer: Start of BASIC text - Normal value:2049
45-46	Pointer: Start of BASIC variables
47-48	Pointer: Start of BASIC arrays
49-50	Pointer: End of BASIC arrays +1
51-52	Pointer: Bottom of string storage
53-54	Utility string pointer
55-56	Pointer: Highest address that can be used by Basic.
57-58	Current BASIC line number
59-60	Previous BASIC line number
61-62	Pointer: Basic statement for CONT
63-64	Current DATA line number
65-66	Pointer current DATA item address
67-68	Vector: INPUT routine
69-70	Current BASIC variable name
71-72	Pointer: Current BASIC variable data
73-74	Pointer: Index variable for FOR/NEXT
75-96	Temp pointer/ data area
97	Floating point accumulator #1: Exponent
98-101	Floating Accumulator #1: Mantissa
102	Floating Acum. #1: Sign
103	Pointer:Series evaluation constant
104	Floating Accum. #1: Overflow digit
105	Floating point accumulator #2: Exponent
106-109	Floating accum. #2: Mantissa
110	Floating accum. #2: Sign
111	Sign Comparison Result: Accum #1 vs #2
112	Floating Accum #1. Low order (rounding)
113-114	Pointer: Cassette buffer
115-138	Subroutine: Get next byte of BASIC text
121	Entry to get same byte of text again
122-123	Pointer: Current byte of BASIC text
139-143	Floating RND function seed value
144	Kernal I/O status word: ST
145	Flag: STOP key/ RVS key
146	Timing constant for tape
147	Flag: 0=LOAD, 1= VERIFY
148	Flag: Serial bus output char. buffered
149	Buffered character for Serial bus
150	Cassette sync number
151	Temp data area
152	No. of open files/ Index to file table - Max number of files is 10
153	Default input device (0) 0 - Keyboard 1 - Cassette 2 - RS232 3 - Screen 4 or 5 - Printer 8 to 11 - Disk drive
154	Default output (CMD) device (3)
155	Tape character parity
156	Flag: Tape byte received
157	Flag: $80=direct mode, $00=program
158	Tape pass 1 error log
159	Tape pass 2 error log
160-162	Real time Jiffy clock
163-164	Temp data area
165	Cassette sync countdown
166	Poiner: Tape I/O buffer
167	RS-232 Input bits / Cassette temp
168	RS-232 RS232 Input bit count / cassette temp
169	RS232 flag: check for start bit
170	RS-232 Input byte buffer/ cassette temp
171	RS-232 Input parity / cassette short counter
172-173	Pointer: Tape buffer/ Screen scrolling
174-175	Tape end address/ end of program
176-177	Tape timing constants
178-179	Pointer: Start of tape buffer
180	RS-232 Out bit count/ Cassette temp
181	RS-232 Next bit to send/ Tape EOT flag
182	RS232 Out byte buffer
183	Length of current file name
184	Current logical file number
185	Current secondary address
186	Current device number
187-188	Pointer: Current file name
189	RS-232 Out parity / cassette temp
190	Cassette read/write block count
191	Serial word buffer
192	Tape motor interlock
193-194	I/O start address
195-196	Tape Load temps
197	Current key pressed: 64=no key
198	Number of characters in keyboard buffer

199	Flag: Print reverse : 1=yes, 0 = no		100 = disable repeat 255 = repeat all keys
200	Pointer: End of logical line for INPUT	651	Repeat speed counter - Normal value: 4
201-202	Cursor X-Y pos. at start of INPUT	652	Repeat delay counter
203	64 no key	653	Keyboard SHIFT key / CTRL key / CBM key 1 Shift pressed 2 Commodore pressed 4 Control pressed
204	Cursor blink enable: 0=flash cursor	654	Last shift pattern
205	Timer: Countdown to toggle cursor	655-656	Vector: Keyboard table setup
206	Character under cursor	657	Flag: $00 disable SHIFT keys, $80= disable
207	Flag: Last cursor blink On/off	658	Flag: Auto scroll Down, 0 = on
208	Flag: INPUT or GET from keyboard	679-767	Unused locations
209-210	Pointer: Current screen line address	768-769	Vector: Print BASIC error message
211	Cursor column on current line	770-771	Vector: BASIC warm start
212	Flag: Editor in quote mode, $00=NO	772-773	Vector: Tokenize BASIC text
213	Screen line length	774-775	Vector: Basic text list
214	Current cursor line number	776-777	Vector: Basic character dispatch
215	Temp. data area	778-779	Vector: Basic token evaluation
216	Flag: insert mode >0=#inserts	780	6502 A register
217-242	Screen line link table/ Editor temps	781	6502 X register
243-244	Pointer: Current colour RAM location	782	6502 Y register
245-246	Vector: Keyboard decode table	783	6502 SP register
247-248	RS-232 input buffer pointer	784	USR function Jump instruction (76)
247-248	RS-232 output buffer pointer	785-786	USR address low byte/ high byte
251-254	Free zero page	787	Unused
255	BASIC temp data area	788-789	Vector: Hardware IRQ interrupt - Normal value:59953
256-511	Micro processor system stack	790-791	Vector: BRK instruction interrupt
512-600	System INPUT buffer	792-793	Vector: NMI
601-610	KERNAL table: Active logical file numbers	794-795	Kernal OPEN routine vector
611-620	Kernal table: Device number for each file	796-797	Kernal CLOSE routine vector
621-630	KERNAL table: Second address each file	798-799	Kernal CHKIN routine vector
631-640	Keyboard buffer queue	800-801	Kernal CHKOUT routine vector
641-642	Pointer: Bottom of memory for OS	802-803	Kernal CLRCHN routine vector
643-644	Pointer: Top of memory for OS	804-805	Kernal CHRIN routine vector
645	Flag: Kernal Variable for IEEE timeout	806-807	Kernal CHROUT routine vector
		808-809	Kernal STOP routine vector
646	Current character colour code	810-811	Kernal GETIN routine vector
647	Background colour under cursor	812-813	Kernal CLALL routine vector
648	Top of screen memory	814-815	User defined vector
649	Size of keyboard buffer - Normal value: 10	816-817	Kernal LOAD routine vector
		818-819	Kernal SAVE routine vector
650	Flag: REPEAT key used, 0 = normal operation	820-827	Unused
		828-1019	Cassette buffer storage area
		1020-1023	Unused



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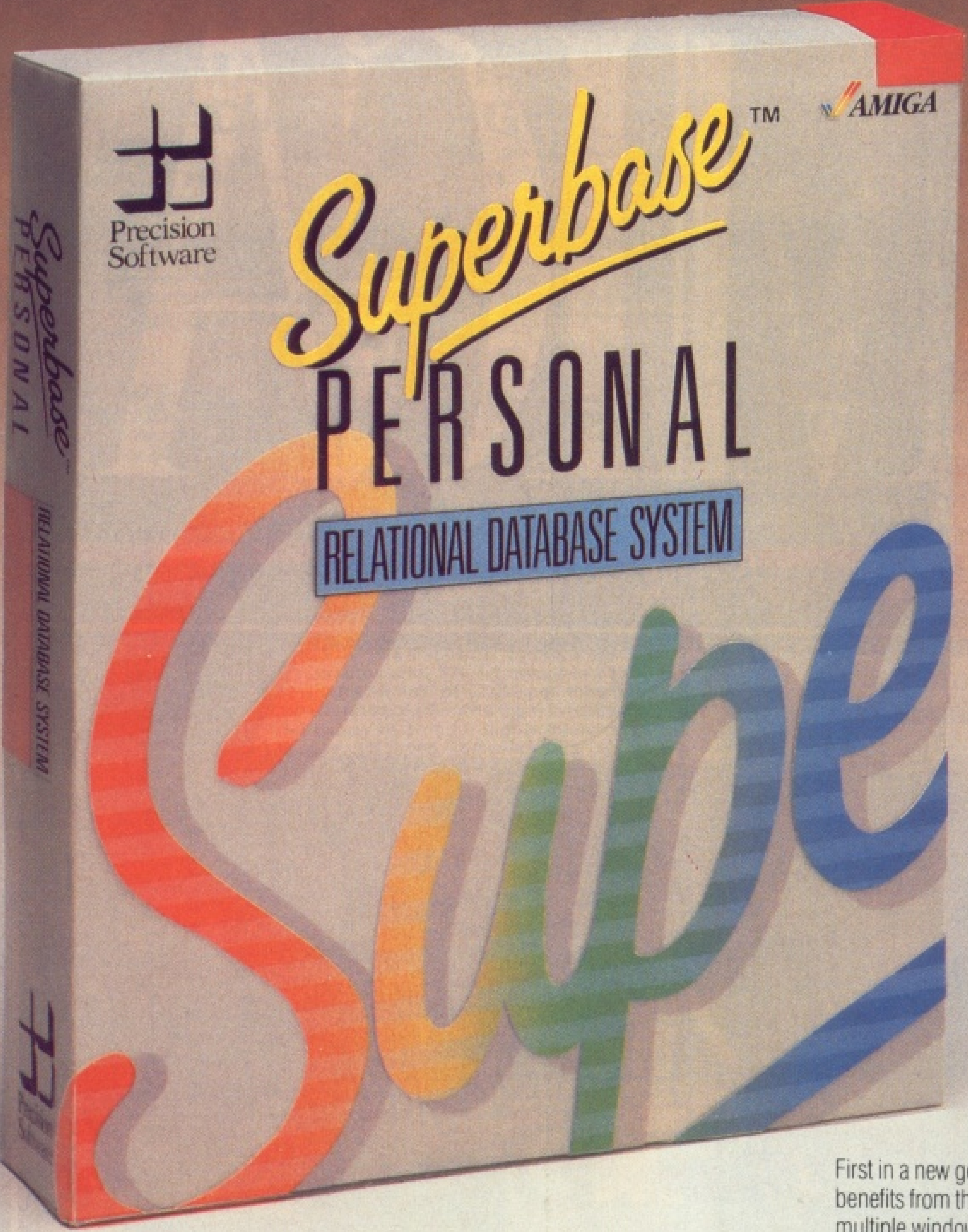
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Your Amiga

Your Amiga makes its debut amongst a rising tide of interest in this range of Commodore 68000 based computers.

Software companies are revelling in the power of the Amiga. Artists and musicians are m aking a name for themselves designing and composing for the new generation of software now being released. Games have taken on a new dimension. No-one is averse to the odd game, especially when they are as good as Marble Madness, The Pawn or Leaderboard.

Programmers will find an unequalled range of software development tools and for the amateur there are public domain utilities, picture shows, instrument samples, an almost overwhelming amount of software. Many have complained about a 'closed machine' and 'no documentation'. They haven't looked. There are official manuals and at least two other major publishers supplying detailed documentation.

The Amiga presents a problem for the serious user: how can something which looks so good be really practical? The answer is in the hardware itself, the interfacing ports for printers, modems, extra storage and memory expansion. Cheap add-on memory is still a twinkle in some engineer's eye but a relentlessly increasing user base will undoubtedly bring it forth.

The software key lies in the friendliest of user interfaces, which, when properly implmented, makes the most complex software, easy to use. And in multitasking, the unique ability of the Amiga to do more than one task at once. What could be more practical, time saving and cost effective than that?

There's much to look forward to. *Your Amiga* will bring you the news. If there's a particular area of computing with your Amiga you would like covering then drop us a line. We'll do our best.

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Free time on your Amiga.

NEW AMIGAS

American sources have revealed exclusively to *Your Amiga* the plans that Commodore has made for the new generation of Amigas. In essence, two new Amigas will be released to supercede the current A1000. Their working names are, at the moment, the A500 and A2500.

The A500 is Commodore's attempt to break into, and dominate, the Atari ST market. In effect the machine is a cut down version of the current A100, with the same 512K and single $3\frac{1}{2}''$ disk drive. To cut costs, and allow Commodore to reach their target of around \$500, the A500 has a greatly reduced power supply, and the Kickstart system disk has been incorporated in a ROM, rather than the current disks. Otherwise the machine is identical to the A500, and will run all the same software.

More important the Commodore, in order to ensure the success of the Amiga, there is the new top of the range A2500. In layman's terms, Commodore has attempted to release an IBM PC style Amiga. It features 1Mbyte of RAM, split into 512K, chip memory, and 512K fast memory. When the individual orders the machine, they will be able to specify what disk set-up they require, which options of $3\frac{1}{2}''$, $5\frac{3}{4}''$ or hard disk.

The real departure for Commodore is that the A2500 has a very open box design, similar to the PC, allowing for much more expansion. Inside the A2500 are seven expansion slots, five of which are Amiga slots and four are IBM AT (not PC) compatible. As these figures would suggest, two of the slots can be configured either for the Amiga or a PC AT.

In order to allow the Amiga to act either in purely Amiga mode, or as Commodore sees it, in Amiga or PC mode, the Sidecar module has now been sufficiently reduced in size to fit into one of the available expansion slots, not as before in a huge and ugly box.

Although the A2500 will not come equipped with the rumoured 68020 processor, it seems likely this too will be an option, and not at the current price of circa \$2000. Average price for the A2500 is expected to be between \$1500-\$1800, and sources suggest the new specification has been well received by everyone who has seen it, and this bodes well for the Amiga's future.



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Amiga Leisure

Not only is the Amiga a useful business tool, it can also greatly enhance your leisure hours.

By Anne Owen

It didn't take a genius to predict that the Amiga would inspire a new generation of games for personal computers. The sound and graphics hardware is begging to be used by designers and programmers. Of course the first batch of games are the offspring of earlier games for the Commodore 64, all improved beyond measure by the superior hardware. We've reviewed *One on One, Seven Cities of Gold, Skyfox, Archon 1* and *Marble Madness* already. Now there's *Archon 2*, just as good as the original and perhaps a bit too much like it. The strategy has changed, the combat remains the same.

Playscreen

Coming soon... *Little Computer People*, that weird game which makes you wonder who is watching whom as the computer people go about their lives, now and again tapping on the screen to attract your wandering attention!

Adventure Construction Set from Ariolasoft. Makers of *Castles of Apshai* and *Leaderboard*, perhaps US Gold will also bring out Epyx' *Rogue*.

Infocom adventures, including those *Leather Goddesses from Phobos!* and the *Hitchhikers Guide to the Galaxy*, both £24.95.

Firebird has just released Level 9's *Jewel of Darkness* compilation.

It combines *Colossal Adventure, Adventure Quest* and *Dungeon Adventure*. There are over 600 locations, a 1000 word vocabulary and over 600 locations, a 1000 word vocabulary and over 600 illustrations. You also get one of Rainbird's novella's *The Darkness Rises*, Price £19.95.

The follow up, *Silicon Dreams* – consisting of *Snowball, Return to Eden* and *Worm in Paradise* – is under development.

Something to look forward to in the New Year will be Jeremy Sans' *Starglider*, already an Atari ST hit.

The Halley Mission is another American game which may make its way to these shores. A variety of flight missions have to be completed by the hyperspacing astronaut. Star maps and docking procedures beg comparisons with Elite but the overall look and aim of the game are sufficiently different to give the authors the benefit of the doubt.

The digitised music recording which fades in and out during play is a great touch and a further indication that games designers are looking to television and video for their inspiration these days.

The Pawn follow up from Magnetic Scrolls will be *Guild of Thieves*, planned for early 1987.

Activision has launched a game called *Tass Times in Tonetown*, a graphically surreal game. Here's hoping it makes the trip East.

Home Position

Gismoz is a set of 15 desktop accessories which you might like to add to your collection. The cuckoo alarm clock sums up the seriousness of the product and it looks a little overpriced at £44.95.

For those names and addresses there's *MiAmiga File* from Haba Systems. Data is held entirely in memory, which makes for speed, and is displayed in a spreadsheet format. Pricey at over £85 however.

Instant Music

These days the more sophisticated buskers who entertain the crowds on the London Underground or Saturday morning shoppers up and down the country, employ technology to help them. Often a recorded backing tape accompanies them as they solo on guitar, saxophone or flute.

Now there is a computer equivalent in *Instant Music* for the Amiga. *Instant Music* can act as your backing track as you solo on the instrument of your choice. *Instant Music* will help you sound good too, masking any lack of real musical skills. And you can swap instruments rapidly. Imagine yourself a busker again, right foot pounding on a bass drum, cymbals strapped to your forearms, strumming a banjo, harmonica at your lips. *Instant Music* plays tirelessly, although sometimes tiresomely, and lets you sit back and 'jam' with the mouse by moving the cursor up and down the screen (scale) and hitting the mouse button (hitting a key, plucking a string, strumming a chord).

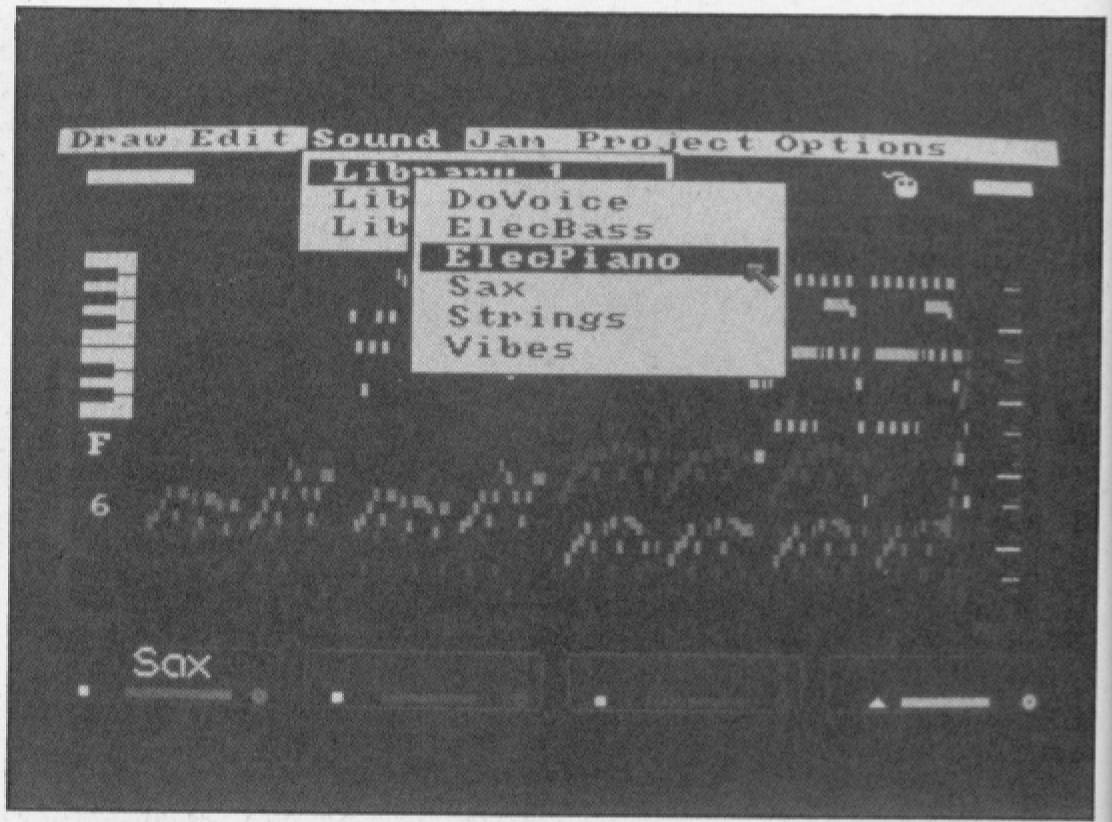
Sequences of notes and chords play back at the press of a mouse button. The music is 'instant' because there are a half dozen boxes on the disk full of preprepared pieces, classical, jazz, rock and folk among them.

There are four instruments in the instant music band and you can take

one over and 'jam' with it. Your efforts will be intelligently incorporated into the tempo and rhythm of the piece (fixed model), controlled according to a setting made at the keypad – two in time with a foot tap, six a rapid triplet sequence etc. – or 'free' jamming – for experienced play-along-a-record musicians.

There's a whole library of instruments to choose from and most of the sounds are veyr realistic. The Amiga's digital to analogue convertors provide for pretty accurate representations of sounds – witness the 'reedy' flute playing in *The Pawn's* introductory sequence. Each instrument can be transposed and the volume subtly controlled with slider switches. The colour representation of the instrument waxes and wanes appropriately with the change in volume.

There's conventional music notation in the tutorial and in the menus for Edit but the music screen contains coloured blocks which represent notes. The duration of the notes is determined by the rhythm track currently active. Optionally an animated piano keyboard can be displayed along with the notes as they are played.



A song may be longer than the screen display. Small sections of a song can be 'magnified' to screen size for editing. Sections can be moved or copied in quite a sophisticated fashion, notes and rhythm, just notes or just rhythm, within the song. Preset patterns of notes can be drawn on screen with a 'rubber band'.



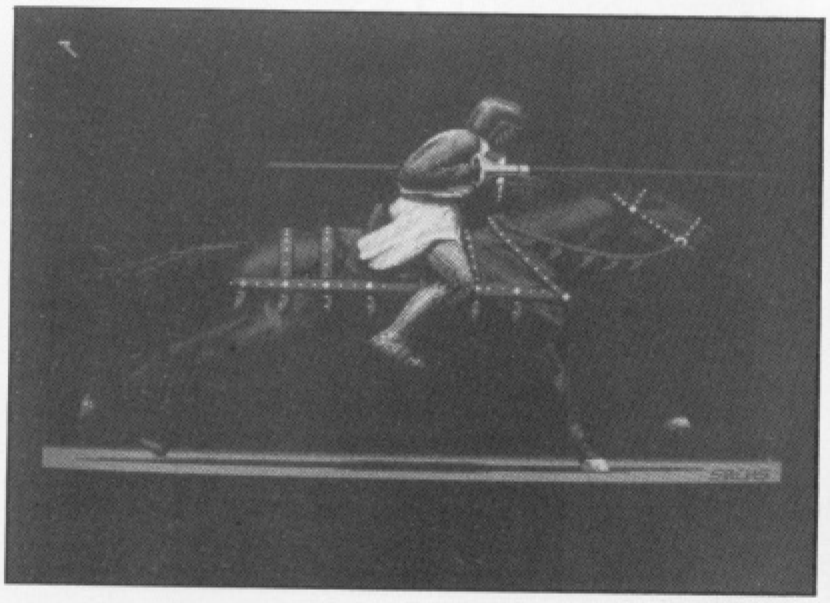
In all honesty I've only just begun to adventure beyond the 'instant' in *Instant Music*. The sound is stunning and stereo but the examples can wear a little thin. We are hardly into the excellent mini manual so where do we go from here? Or to editing the supplied rhythm templates to gain familiarity and then on to composing your own tunes and learning about music. There is a lot to be learned from the package.

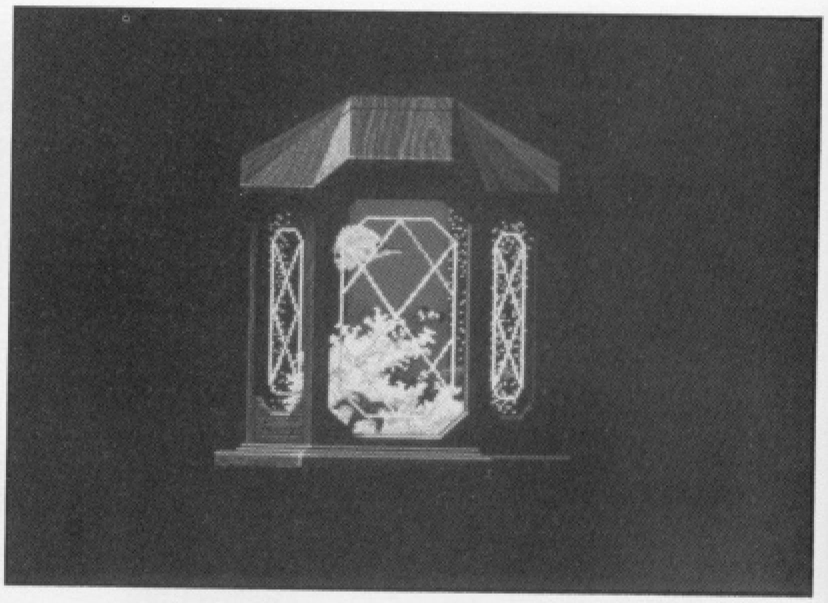
You'd need a broad hat and a very long extension cable but busking with your Amiga isn't beyond the realms of possibility. And it's great at parties.

Other musical packages available are *The Music Studio* from Activision and *Music Craft*. The former apparently allows you to design your own sounds, offer conventional notation on screen and in print and interfaces to MIDI. It certainly sounds like a strong competitor to *Instant Music* at £30.43.

Conversation with a Computer

This is an amusing piece of software from Jenday Software, ideal for the computer beginner. The documenation and software go hand in hand, the main purpose being to introduce Basic in a slightly more friendly way than the manuals. The actual content is a memory test, a battle of numbers and a pegboard game. The games themselves





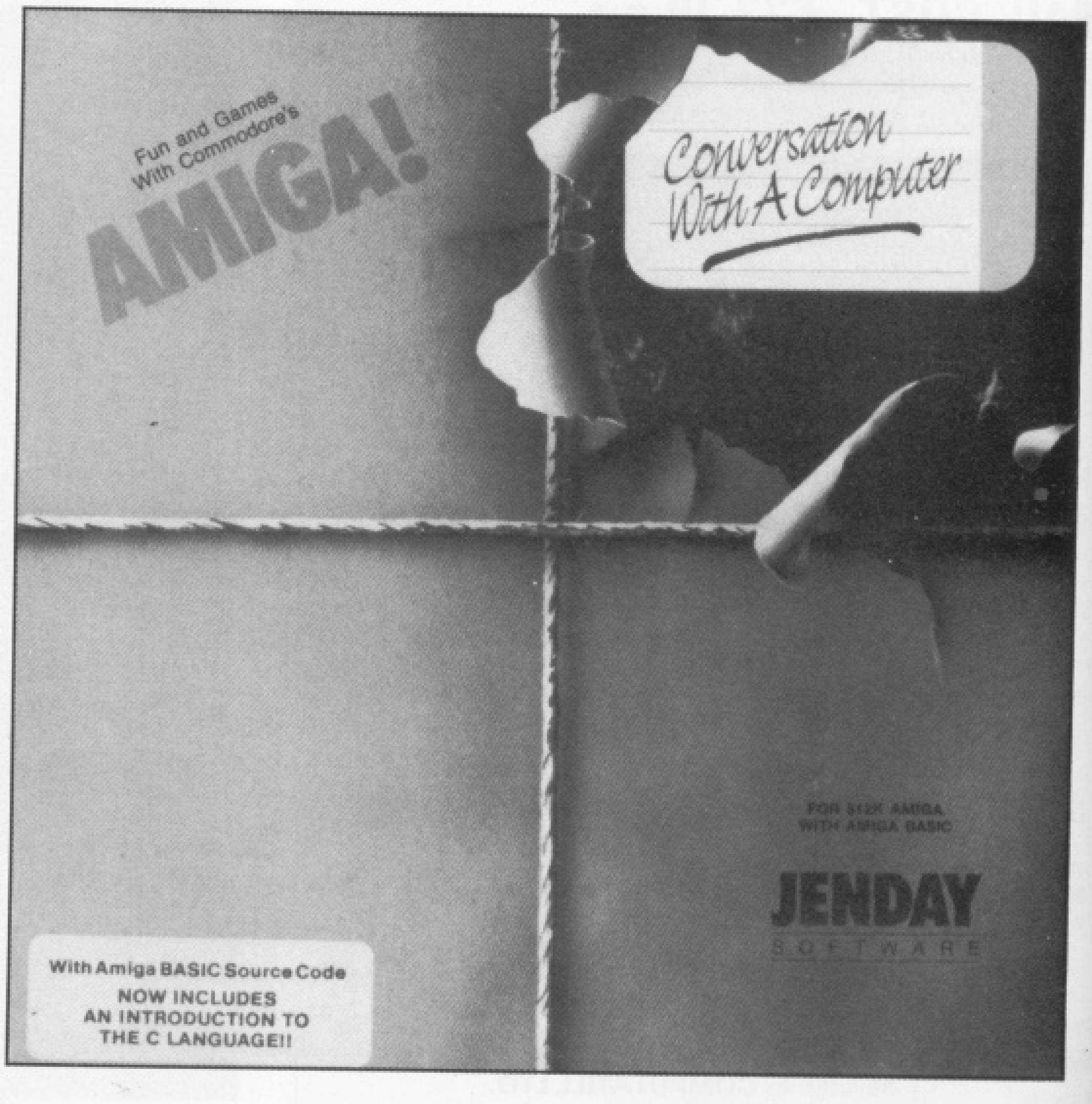
are not particularly valuable although they are undoubtedly fun, but when combined with the documentation the Basic routines become comprehensible. Completing the conversation – the computer does literally speak to you – will result in an insight into Basic programming. Parts of the code may also be useful material for the amateur programmer.

The whole package is reminiscent of a well-written magazine article but with all the code on a disk ready to run or inspect. Since the C language is so important to the Amiga system, two programs identical in purpose, one in Basic and one in C, are also included so that the beginner can observe the differences in action. This portion includes and introduction to C commands. The execution speeds of the two programs is englightening and C compilers are widely available for the Amiga if this sparks your interest.

Conversation with a Computer is a very laid back and humourous way of getting to know a bit more about your Amiga and I would heartily recommend it to beginners, faced as they are with an incredibly powerful computer. This is the friendly face of the Amiga. It's marketed in the UK by Computatill of Oldham. YA

Touchline

Cavendish Commodore Centre/UK Amiga Users Group: *66 London Road, Leicester LE2 OQD.* ***Tel:*** *0533 550 993.*
Viza Software: *Chatham House, 14 New Road, Chatham, Kent ME4 4QR.* ***Tel:*** *0634 45002.*
Computatill Ltd: *77/79 Chadderton Way, Oldham OL9 6DH.* ***Tel:*** *061 652 8006.*
Precision Software: *6 Park Terrace, Worcester Park, Surrey KT4 7JZ.* ***Tel:*** *01 330 7166.*
Kuma Computers Ltd: *Pangbourne, Berkshire.* ***Tel:*** *07357 4335.*
Rainbird Software: *74 New Oxford Street, London WC1A 1PS.* ***Tel:*** *01 240 8838.*
Club Amiga: *85 Upper Drumcondra Road, Dublin 9, Ireland.*
Independent Commodore Products Users Group: *57 Gunnersbury Avenue, Ealing, London W5 4LP.* ***Tel:*** *01 993 2634.*
Local Commodore Business Centre: *0536 205555.*
Y2 Computing Ltd: *Tarmay House, 146-150 St Albans Road, Watford, Herts WD2 4AE.* ***Tel:*** *0923 50161.*
High Voltage: *53-59 High Street, Croydon, Surrey CRO 1QD.* ***Tel:*** *01 681 3022.*
AB Computers: *173 Thornbury Road, Osterley, Isleworth, Middlesex TW7 4QG.* ***Tel:*** *01 568 7149.*



Amiga Library

More and more products are appearing for the Amiga, we take a look at two books from First Publishing and Precision Software.

By Anne Owen

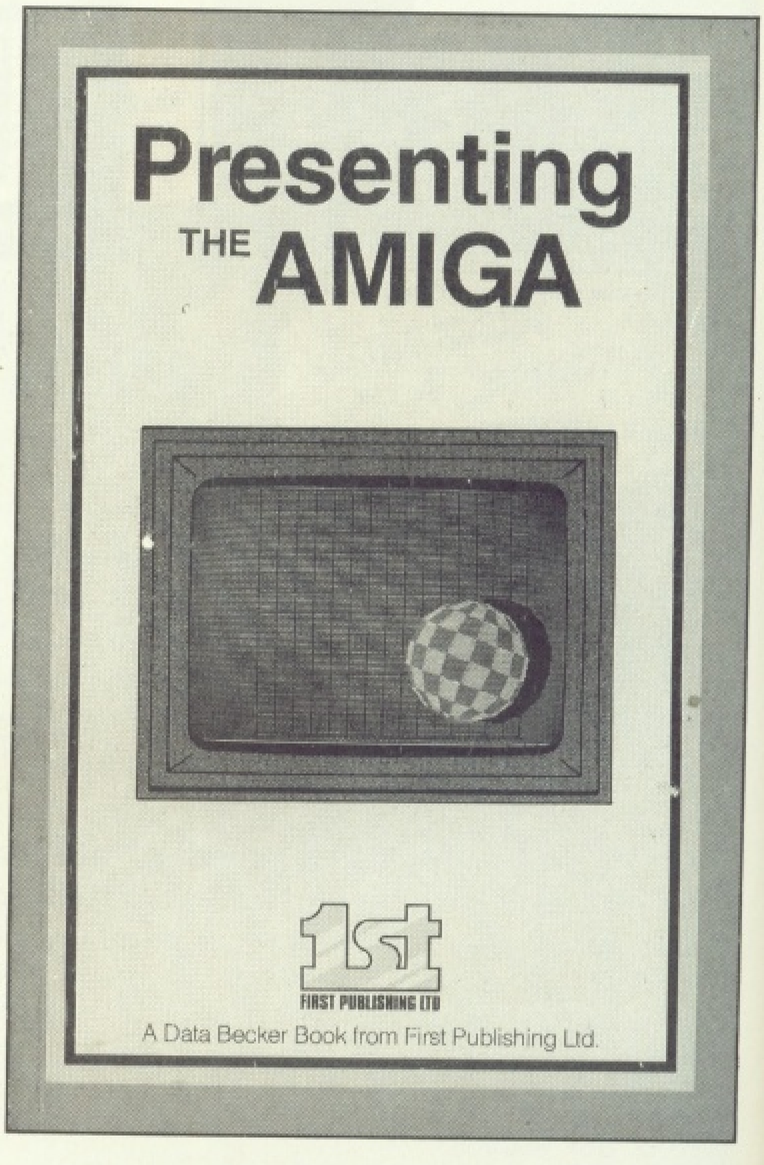
Amiga for Beginners from First Publishing is a book of German descent. Written by Christian Spank, a German magazine contributor, and published by Data Becker, First's parent company. Though typeset, the layout of the book betrays its wordprocessed origins with block paragraphs. The subediting has overlooked a number of typing errors and inconsistencies – reference to illustrations that don't exist, to the "magazine article", german captions on a photograph etc. Nothing of great consequence. The 240+ pages includes a group of colour photographs at the end of the book, all culled from Amiga introductory software and therefore nothing new if you've already got the computer.

Mr Spank intends, in his chatty, joke cracking style – e.g. "This makes it clear that in Basic one can make as many lovely RETURNs as Boris Becker" – to entertain as well as teach and he does both very effectively. The first 90 pages are a solid substitute for the flashier but less informative Amiga manual. The step by step look at Workbench is exhaustive and very useful for the beginner to computing on the Amiga and to Basic and disk operating systems, which is totally in line with how Commodore present the computer to the public.

The fun bits of Basic are covered. Under graphics there are explanations of commands like AREA, AREAFILL, GET and PUT (for moving areas), PALETTE, COLOUR, CIRCLE, PAINT (flood fill) and line.

Animation – an exciting topic for new computer programmers – is covered with looks at the object editor (bobs or sprites) which itself has pen, line, oval, rectangle and eraser to help you design your sprites. We find out how to read sprite data into a Basic program, assigning it to objects, giving priorities, moving in x, y with v (vertically, horizontally and at a specified speed). A simple rocket program is developed to demonstrate these principles.

On the similarly attractive subject of sound and speech there are brief tutorials on SOUND command parameters,



pitch, length and volume and on the SAY command parameters, male/female, human/robot, speed, pitch etc.

The text is occasionally livened by a "tip". There is also a

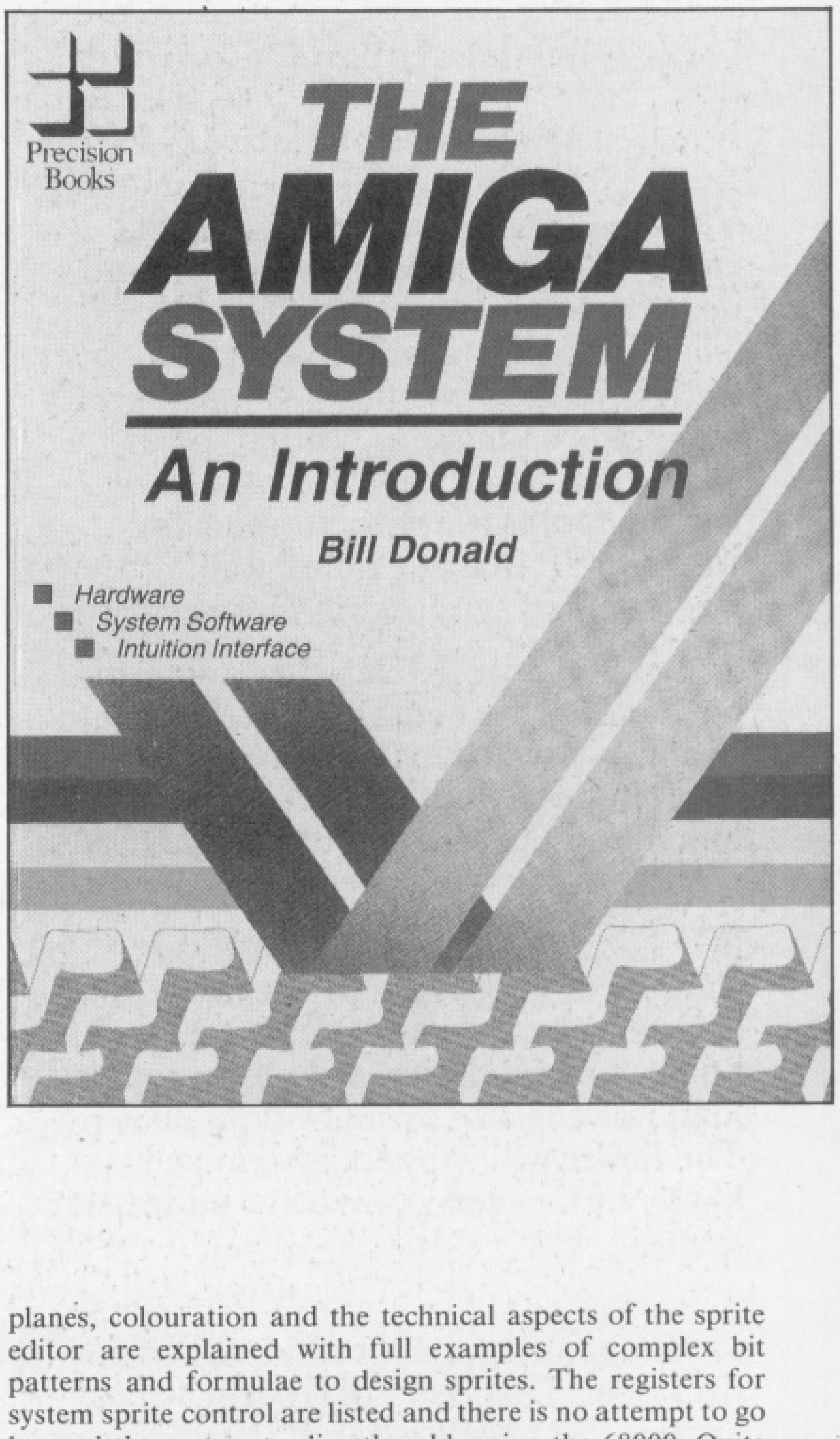
Problem/Solution appendix for beginners and an icon editor description. The author has used his "beginner" or "guinea pig" to find out what jargon needs explaining to the inexperienced user and this results in an extended glossary, as well as a fairly jargon free text. A list of icons used in Workbench is spoiled because they are too small and indistinguishable from each other in the photographs, the opposite of the reality in which Workbench icon graphics are very detailed, in colour and clear.

The book rightly refuses to resist the temptation of looking at Amiga DOS, the disk operating system upon which the operation of the computer is based. Cleverly the author deals with only those DOS commands which underly the facilities looked at earlier in Workbench sections, functions such as copying, renaming, gathering information about a file, dating a file etc. There are a variety of information sources for program or data files on every DOS disc. For instance you can list files dated since 01 Jan '86 or even type in "list since Thursday". It works!

The OPT command is the limit of the investigation of Amiga DOS. It acts, along with the DIR command, as a sort of disk menu program.

Amiga for Beginners, despite the production faults, pointed out, is a delightfully easy read for the new computer user. It's not going to teach the hacker anything new but then that audience is catered for by the technical manuals. Commodore should have employed Herr Spank to advise on making their documentation as user-delightful as their marvellous user interface.

Touchline
Company: *First Publishing, Unit 20B, Horseshoe Rd, Horseshoe Pk, Pangbourne, Berks.*
Tel: *073 575 244*
Price: *£9.95*



AMIGA SYSTEM — AN INTRODUCTION

Bill Donald has quickly become the most prolific writer covering the Amiga in magazines and in his first book aimed at the owner and potential purchaser of the computer. He is uncritical of the machine and presents an enthusiast's view, impressed by the "open" nature of the Amiga operating system as well as the obvious graphical and musical capabilities of the machine.

The hardware overview makes it all seem very simple. The 68000, video co-processor and blitter chip are all explained in terms of their place in the architecture.

The specification, we are told, is impressive. The blitter can achieve 10 times the speed of the 68000 alone doing the same fast memory moves. Four low noise digital channels (moving away from the idea of a customised sound chip (offer hi-fi performance. The dynamic memory location (no hard memory maps), circuits (routines to call to perform functions) and the library of overlays, graphics, editors and fonts and disks make up a powerful system.

Graphics is the first major topic, with an explanation of "playfields", how they are constructed, their co-ordinate map, modes, screen memory requirements, colour content, scrolling and "hold and modify". Dual playfields are supported and a "spare" playfield can be independently controlled.

Sprites are naturally part of a Commodore machine. Bit planes, colouration and the technical aspects of the sprite editor are explained with full examples of complex bit patterns and formulae to design sprites. The registers for system sprite control are listed and there is no attempt to go beyond the system to directly addressing the 68000. Quite rightly since the technical material already presented is heavy going.

The chapter on system control deals with display, collision detection (as used to drive Work Bench), interrupts and direct memory access (for compressor and blitter).

Interfacing covers mouse, joystick and light pen, the hardware and the software registers and routines involved.

Since the Amiga is very much reliant on disk based software, the drives are of great interest. They are controlled by two 8250 control interface adaptors, which can support up to four drives, 3.5" or 5.25". There is no real detail about directly addressing the controller chips but there are registers to achieve format control, a possible means of reading other disk formats, including previous Commodore formats. This could be a method for a business wanting to transfer large data files.

The keyboard is briefly dealt with. Even the keyboard has its own processor!

This introduction is a fair alternative to the Amiga DOS manual for the beginner. The introductory disk glosses over the DOS and there's much to investigate. The chapter on files and devices is a good guide.

You learn about how the Amiga assigns priorities to multiple processes, how many CLI windows you can open, or have working 'at once'. The hierarchical directory structure of the filing system is looked at, the special characters recognised by the system and the alternative devices which can be made current or specified in the commands: the screen, printer, parallel and serial ports, RAM disk, hard disk, hard disk and other drives.

Special directories on the Work Bench disk supply fonts, overlays for DOS and icons. Drivers written in the C language can be added to the Preferences menu – which 'sets up' the computer automatically. The author gives examples of directory information and of command line syntax.

Next on Mr Donald's list are the system editors, Ed and Edit, text editor and line editor. Both sets of commands ae given in full and the capter acts as a handy reference if you don't have the DOS manual. Edit is a fairly conventional screen editor, half way to a wordprocessor. Edit works only line by line but has delete/replace/insert functions by string or line reference. Separate command files can control editing as well as commands from the keyboard.

Windows and screens are the next topic and a fascinating one it is too. The Amiga has a graphics interface like no other – solid colourful icons and windows with which you can do amazing things just by clicking on a gadget. I'd have liked to have seen this section earlier in the book. After all, the windows are the first thing you meet. There are four different types available to the programmer, Backdrop, Borderless, SuperBitMap and Gimmezerozero. Gadgets are small icons which activate closing, dragging and sizing windows. The proportional gadget gives you a 'slider' control on screen.

Windows often carry menus. This section details how menu options are 'excluded', lists the command key equivalents of menu options and discusses 'requesters', those windows which sit there patiently until you respond.

The next chapters, on systems software and graphical support, are highly technical overviews of the operating system, how it handles memory allocation, interrupts, I/O and graphics processing – sprites, bobs, text etc.

Technical appendices A to M, a substantial glossary and a diminutive index finish of a book which has gone further than its 'An Introduction' subtitle leads one to expect.

The sheer volume of information in this book makes it good value for the amateur programmer who is hooked or interested in getting the money to become hooked by the Amiga. Although hard going at times because of the bulk of data thrown at you it is a fascinating read. Only on one or two occasions does the author go over the top in his obvious admiration for the machine and we can forgive him that. It's an over the top computer! YC

Touchline
***Company**: Precision Software, 6 Park Terrace, Worcester Park, Surrey KT4 7JZ. **Tel**: 01 330 7166. **Price**: £9.96.*

Amiga Roundup

If you own an Amiga or are thinking of acquiring one, you need to know what's available to make the most of its capabilities. We shed light on the matter.

By Anne Owen

When Commodore at last launched the Amiga UK in May 1986 we finally discovered the specification and the price: 512K computer, internal 3.5" disk drive, colour monitor. Price: £1450. If you're intending buying an Amiga now then make sure you haggle a bit. The base machine (256K) is on offer at £975+VAT. The upgrade to 512K will cost a further £1000+VAT and an external drive another £200+VAT. Other add-ons start in the over £500 category. So the Amiga is not a cheap computer. It is however unique in a number of ways and software is now starting to come on to the market which exploits this uniqueness.

Is it a business computer? Well, if your business means marketing, advertising, sales literature and the point of sale, as well as planning and personal productivity, then yes, it surely is. If you employ imagination in your business then you'll have no trouble in justifying your Amiga.

In this first *Your Amiga*, we'll take a look at the range of software now available. There's something for most tastes, from high level languages to arcade games and simple utilities. Some areas, such as graphics, are particularly well supported and new developoments are on their way from America. So watch these pages as we bring you up to date with *Your Amiga.*

Guru Meditation

When the Amiga - dare I say it - crashes, the Guru takes over and gives you an error code before rebooting the system. Hence the name for our look at programming tools for the Amiga.

Seka Assembler

Kuma's 68000 assembler is accessed via the CLI (command line interpretor) so you will have to enable CLI at the Preference menu. Typing SEKA takes you into the assembler. The Escape key toggles into a full screen editor which supports cut and paste and locate text (once only, hit L for the next occurence).

The commands Kill and Old lose and regain your text and you can interrogate the software on how much memory is left in the buffers. Syntax is standard 68000. There are useful labour saving devices such as pseudo opcodes, like EQUate, macros (which repeat routine sections of code) and conditional assembly (assembly of certain routines only if circumstances require it). A symbolic debugger partners the assembler. You can 'step through' and 'trace' and breakpoints can be set.

Other commands interact with DOS and deal with the assembling and linking of files. AmigaDOS entry points are documented and interaction with AmigaDOS and EXEC libraries explained in the manual, along with some examples to experiment with. If you are planning on starting out with 68000 assembler you will need a 68000 tutorial as well.

Although much of Amiga program development is being done in high level languages, the combination of assembler and monitor in the package makes the *Seka* assembler a handy programming tool for the professional programmer and for the newcomer determined to learn 68000. Price is £69.52.

Languages

AC/FORTRAN, *Lattice C*, *MCC Pascal* and *Cambridge LISP* are amongst the languages commercially available for the Amiga. As a tribute to the development work taking place for the Amiga, there is a near finished version of *Modula 2* in the public domain, as well as a *Forth* and a variety of program editors. A professional editor is Micro Forge's *Programmer's Editor* (£69.95).

Toolkits

Metacomco has released a programmer's toolkit for the Amiga. Developed by one of the major forces in Amiga software and producers of AmigaDOS itself, the Metacomco toolkit is likely to become one of the most used programming aids for the machine.

Basic

For the average user Basic is the bundled language and should prove a more than adequate implementation. The original *ABasic* has been replaced with a Microsoft *Basic* which uses two windows, one for the listing of the

program and one for the results of the program. There are full cut and paste, cut and move, replicate, single step, trace, stop and continue facilities. The two window scheme allows the user to watch the program output while the part of the listing currently being executed is highlighted. Amiga *Basic* does not use line numbers. There are a wide range of loop structures such as WHILE. . .WEND and GOTO is used to jump to a label, the name of routine anywhere in the program.

AmigaDOS

AmigaDOS is initially hidden away from the Amiga user. It has to be enabled from Preferences – a complete Amiga configuration program – and it can then be entered via the system drawer on the Work Bench or you can create a disk which will go directly into *AmigaDOS*, opening a window on the screen with the chevron prompt, 1 > , in the top left hand corner.

In *AmigaDOS* you type a command and its parameters and press the Return key to make it work. If you get it wrong then an error message is reported and you will have to retype. The command 'why' will remind you what went wrong.

There are various commands such as dir, list and info which give details about disks and files. Dir displays a sorted list of files, some of which may be directories themselves containing further files and directories. This hierarchical filing system combines with the ability to use long filenames, to date stamp and to write notes for each file on the disk, makes locating and identifying files very easy.

AmigaDOS deals with devices, floppy disks, parallel and serial ports and RAM disk among others. The devices can be specified in an *AmigaDOS* command. For instance you can type a text file to the screen (default device) with 'type filename', or to the printer with 'type filename to PRT', or to the serial port with 'type filename to SER'.

Of course the main feature of *AmigaDOS* is that it is multi-processing. You type 'newcli', meaning open up a new window with a new command line interpreter into your first window and a second window opens with the prompt 2 >. Although the computer is in the process of, say, copying an important directory on to a backup disk in



window one, the window in which you are working is available for typing further commands or even opening another window, 3 > .

Going Public

Bulletin boards are the main means by which public domain software is distributed. Despite the rather odd pinouts of the RS232 port, the Amiga is already a communications machine par excellence. The public domain itself contains many terminal programs, some very well implemented and with Kermit and XMODEM transfer. There's also a full Kermit, a communications standard via which data can be taken from another computer and translated into the correct format for the Amiga. *OnLine!* is a £69.95 commercial product form Precision Software which adds the professional touch to your communications, including support for command-driven auto-dial modems.

Inexpensive

Public Domain software for the Amiga is an inexpensive means of getting more from your expensive computer. I sent off for, count them, 50 disks full of freeware from American sources. But I only had to send to Cavendish Computers in Leicester.

The set of disks contains some odds and ends and full, up to date sets of two American freeware distributors, the *Amicus* club and a gentleman called Fred Fish. If you aren't adventuring further than the *Workbench* then the Fred Fish disks will appear somewhat unfriendly. The *Amicus* software however is accessible through *Workbench* and anything more complicated than a demo is well documented. There are also tips and technical articles and reviews to read on screen or printout.

Apart from the immediate entertainment value of pictures digitised with the *Digi-View* frame grabber, a Speech Toy which is much neater than the Workbench demo and numerous instrument sounds, there is a variety of utilities, games and languages.

The utilities include printer drivers, disk menus and memory maps. Some are stunningly useful, others mere trinkets. There's piece of comms software on nearly every disk!

Many take the form of a tutorial e.g. a font designer or a windowing demo. For programmers there is such material to get through and plenty of examples from which to learn.

The games are mainly Basic, card games, a Startrek game, nothing special, and some in the original Abasic and unuseable in *Microsoft Basic*. *Hack*, on the Fred Fish disks, is a full dungeon and dragons game, low on graphics, high on humour.

Graphics abound on the disk, from 'wallpaper' demos to three dimensional cubes which try and break out of the screen, to professionally

presented mandelbrot generators. There are also suites of utilities for handling screen graphics, in the standard Iff format which makes them portable between software packages.

Languages feature fairly strongly with attempts at *Lisp* and *Forth* – a pretty professional version – and lots of interest in *C*, routines, fixes and enhancements for compilers and Unix style additions to *AmigaDOS*.

I would suggest that the *Amicus* disks are great value, bringing you right up to date with a year's worth of American material. If you have the time the Fred Fish disks are also interesting – but you'll need to get on with *AmigaDOS* if you want to use them. It's worth learning since the disks become ever more sophisticated with official demo programs form *Aegis Animator* and *Aegis Draw*, a full Mandelbrot investigation program and more and more impressive slide shows dominated by the work of computer aritsts, Jim Sachs, Sheryl Knowles and Jack Haeger.

There are also tutorials, editors, terminals and utilities mixed in. Some of the more complex programs require the setting up of a new disk with elements copied form the library disk, *Workbench* and *Extras*. There are full instructions in text files on the disks. The essential *AmigaDOS* commands to access the programs are:

cd name of disk/directory > to select drawer
dir < names > to inspect files

type Readme to get on-screen instructions.

If you take your own disks along then you pay only duplication cost (and it is only cost). Postage and packing is extra. Media and duplication results in a charge of £34.70 per 10 disks.

Incredible value either way.

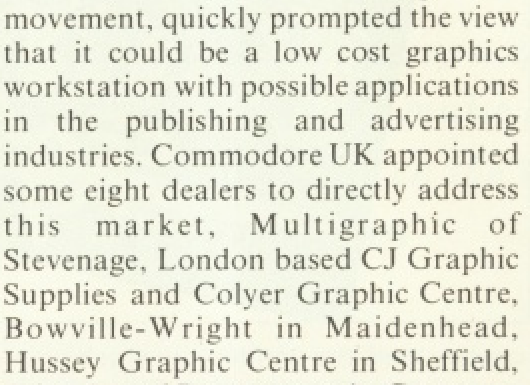
User Clubs

Most important for new Amiga owners however is the source of this public domain software, the *UK Amiga Users Group*. Based in Leicester, the group is currently producing a bi-monthly newsletter. Its links with Leicester's Amiga dealer, Cavendish Computers, mean a 10% discount on a full range of Amiga products. There's also *Club 64/Club Amiga*. The Irish based bulletin board was quick off the mark with the Amiga. The club has extensive electronic links with America and has a library of Amiga disks. Its disk based news letters now contain information about the Amiga as well as other Commodore machines.

Art and Crafts

The Amiga's graphics, number of colours, resolution and sheer speed of movement, quickly prompted the view that it could be a low cost graphics workstation with possible applications in the publishing and advertising industries. Commodore UK appointed some eight dealers to directly address this market, Multigraphic of Stevenage, London based CJ Graphic Supplies and Colyer Graphic Centre, Bowville-Wright in Maidenhead, Hussey Graphic Centre in Sheffield, Print Art of Bournemouth, Grantems of Blackpool and Gledhills in Bradford.

It is certainly possible to see how the creative department of an advertising agency could use a program such as *Aegis Animate* to sketch out ideas for a television advertisement and how a page designer could benefit from experimenting with different layouts and sizes of type using *Deluxe Paint*. The Amiga might even contribute



something to the final product although the tools do not really exist for proper video production or desk top publishing, yet. Cymbol of London is reported to be developing a professional system called *Printer's Devil*.

At least these users have a wide range of software to choose from. The Aegis range comprises *Images*, the art package, *Draw*, the technical drawing software, *Impact*, the executive slide show, *Aegis Animator*, the video/animation designer, and *Artpak*, clip-art for the Aegis programs. *Deluxe Paint* and *Deluxe Video* are the other Aegis programs. The paint programs can be combined with the animate programs resulting in impressive demonstrations for point of sale, window displays etc. *Deluxe Paint* is still number one in my book, even if it does cost nearly £150. The brush facility, which allows you to pick up any part of the screen and manipulate it, will keep me fascinated for months, if not years, to come. It combines ease of use for the amateur practioner of computer art and control of fine detail for the professional.

Other more specific applications are also likely to find their way on to the Amiga because of its graphics abilities. For instance there is an English company developing a package for driving instruction. The system, Amiga and software, will be sold as a package. Just one example of a so-called vertical market.

Serious Stuff

Perhaps the most widely used computer software, often bundled with the hardware, is the wordprocessor. Thus far the Amiga is a big disappointment in this area. The Amiga owner can go out now and buy *Textcraft*, the wordprocessor available form Commodore, with a manual which augments the *Work Bench* and Basic manuals which come with the machine, or they can wait for the inevitable release of more powerful programs. *Scribble!* is an alternative already in the country and the other leading contender at the moment is *VizaWrite*. This is intended to be the start of a desk top publishing system.

The *VizaWrite* specification for the Amiga looks like this: combination of text and graphics (from other paint programs); support for all fonts; screen display as it will print (bold, subscript, page breaks, headers, footers etc.); ease of use, mouse and pull-down menus; ability to use other programs in multi-tasking environment; multiple documents; mail merge; configuration file, document history window; single keystroke recall of frequently used phrases; support for a variety of output.

Coming soon... *PaperClip* from Batteries Included is promised on the Amiga. Mirrorsoft have published specifications for *Fleet Street Publisher* on the Amiga and it includes

interfacing with powerful typesetting mahcines.

But in the meantime a quick look at *Textcraft* and what it can and cannot do for you.

Textcraft

Textcraft is a 60 or 80 column – as you choose – wordprocessor with standard editing, formatting and printing features. It is extremely easy to use and if you don't immediately click with some of the facilities, there is an help screen and a set of one minute tutorials to make things clear. *Textcraft* is enjoyable to use in most respects, especially the moving and replicating of text and the simple means of changing text styles (bold,italic etc.) and text layout (justified, ragged right, centred etc.). Different text styles and format are displayed within the document. Icons and pull down menus are employed throughout.

When starting a new document in *Textcraft*, the user can choose from a number of standard layouts for business letter, curriculum vitae, technical documentation etc. Page length, margins, headers, footers and page numbering are all easily edited and the finished page layout displayed diagramatically on screen. The print option brings up a screen of options, including draft and final (NLQ) text, multiple copies, continuous or single sheet.

What is tedious about *Texcraft* is the file handling. The program takes longer and longer to display the text files on disk as they increase, while you twiddle your thumbs because the program 'takes over' the Amiga and so there is no way out of *Textcraft* to briefly perform another task. You have to reboot the whole system.

Textcraft has proved itself an adequate wordprocessor and is actually recommended to those who are new to wordprocessing. Users of more sophisticated packages on other machines will soon be frustrated by *Textcraft*'s lack of features.

Business

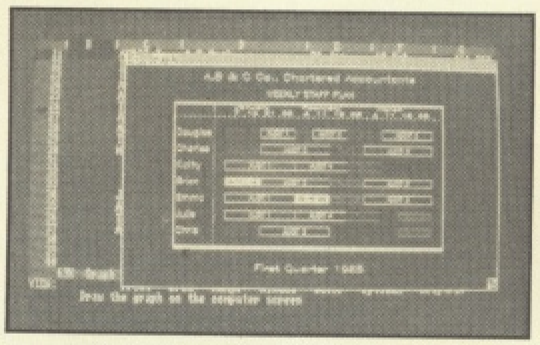
Other business applications are few and far between at the moment. There's Micro Systems' *Analyse!*, a standard spreadsheet supporting up to 256 columns by 8192 rows. As well as pull down menus, commands are on function keys for quick entry. It supports extended functions such as future value, date, standard deviation and variance. More promising is *Logistix* form Grafox, a powerful spreadsheet, database, and time manager with sophisticated graphics presentation. At a new price of £149 it should attract the attention of the business user.

Another alternative solution to the problem of business software availability is the *Sidecar* IBM compatible co-processor board. This runs IBM software in a window on the Amiga screen. At the time of writing deliveries of the hardware from the factory in Germany had not taken place.

Logistix

Logistix is a power user's package. It is a worksheet upon which the screen acts as a window. The four applications which take place on the worksheet are database, spreadsheet, time management and graphicas. The user makes choices by highlighting menu options but cannot use the mouse and therefore *Logistix* doesn't present as friendly a face as *Workbench*.

The Amiga version is not quite converted fully enough to completely gel with the documentation. An Amiga introduction manual would be



appreciated at the price of £149. It is however a powerful package. Given the appropriate setup period, you could computerise a number of business functions with this software. It is even a little too demanding for the standard memory size of the Amiga. Graphics appear in windows with drawing quite slow, redrawing from scratch when moved within the screen. Less overlaying of the program from disk would be necessary with an uprated tow Mbyte Amiga.

The documentation is exceptionally good with fully worked example files on disk to help you master the software. There is also an exhaustive on screen help facility to remind you of the commands available. The graphics commands can be inserted into the worksheet. They take a number of parameters and can result in sophisticated graphical representation of the user's worksheet.

It's not possible to do *Logistix* justice in a brief summary. Do not write off the Amiga as a business computer without seeing this software. The business world is now very demanding of the presentation of its facts and figures. The Amiga/*Logistix* combination is ideally suited to this new role.

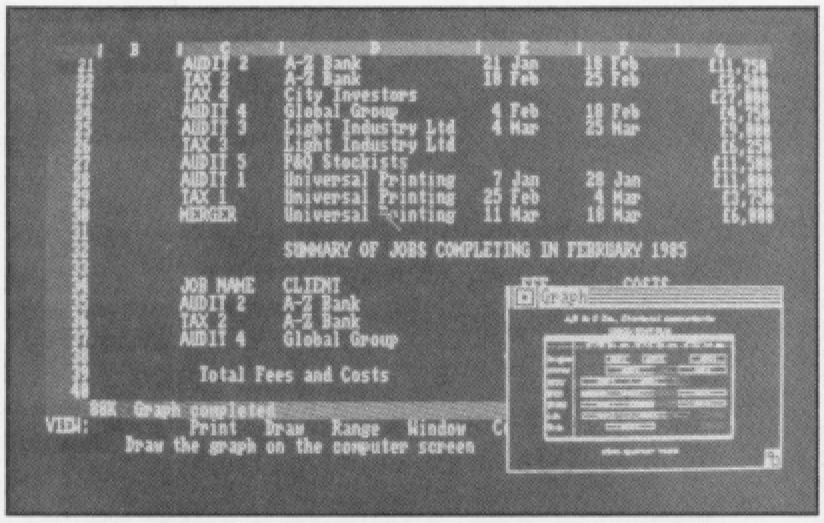
Superbase

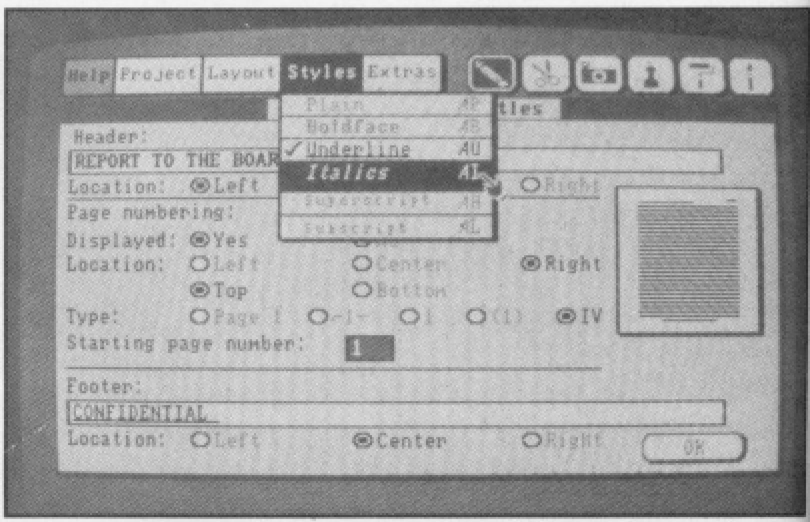
Precision Software has been quick off the mark in producing what is the most poweful Amiga database to date. *Superbase* is a relational database which can process string, numeric and graphics records. It can process and present them in an astonishing number of ways and it has a user interface which dovetails perfectly with the Amiga system. *Superbase* has features of Intuition, such as 'ghosting' of non-active features, menu band and requester boxes. Workbench remains accessible for the activation of other tasks.

There are three screen display styles, record, form and table. The forms can be freely designed, the table fields manoeuvred. The fields on display can be specified from out of the full set of fields (unlimited in number) in a record.

Superbase is a relational database. This means that a file can have connections with another file. In *Superbase*, this other file is described as an 'external' file. The most interesting example on our demo copy of *Superbase* is the picture file. A set of records describes the pictures, the title, the paint program from which they originate etc. The related file is that which contains the pictures themselves. When the 'external file' option is chosen, the pictures related to the descriptions are displayed.

Any estate agents reading this? Well imagine the house descriptions, prices, addresses and features in your house record file. Now imagine the related picture file – architect's plans for a new development or a digitised photograph of an older property.





The records themselves can be subjected to various processes, editing, deleting (batch deletions available), duplication – very useful since the most time expensive task in any database is entering data – and sorting.

Each file has associated indices, up to 999 per file are possible. These indices are updated as the data is updated and they provide a very quick 'lookup' facility on those fields that you have chosen to index. The most likely field to index within a customer file, for instance, would be the surname.

More complex searches are carried out with the aid of the 'filter'. A variety of operators, mathematical, logical and string matching, serve to 'zoom in' on the records you wish to work with a filter command line like

County LIKE "Kent" And County LIKE "Lancs"

would result in all those customers with Kent or Lancashire entered into their County field being displayed for further processing.

The printout options are second to none, including printouts of processed records, screen dumps and label printing. You can use import to load files from other systems and export to save data in a viable form for incorporating into other software.

Despite the power of *Superbase*, only touched on in this summary, the software is extremely easy to use. Everything you need to know is presented on screen. Moving around records is achieved with a set of 12 controls which mimic those of a Video Cassette Recorder with fast forward, rewind, pause and stop. I didn't dare click on the Eject icon!

Joking aside, *Superbase* has transformed my opinion of the Amiga's ability to do the database job. The filing system/storage hardware is not the fastest in the world but *Superbase* appears to operate smoothly, at least with the tens of records in the demonstration files. I hope to build a larger test file to see how it performs with the floppy drives. *Superbase* is ideally suited to hard disk and is designed to make very large files manageable. With this one proviso on speed with larger files and floppies, I would urge the business user to get a demonstration. The £149 price may to some extent reflect the current sales of the Amiga. It also reflects the very high standards of software design and documentation which *Superbase* provides.

Expansion Boxes

The first add-on you know about is the memory expansion to 512K. Some games only require 256K but most of the major packages on the market lack important features if 512K is not available to them. Some, like *Logistix*, favour even larger memories and demand that the user go for even more RAM in the form of add-on boards. The 256K to 512K expansion is a painless plug-in exercise and UK machines sold thus far have usually come packaged with the expansion unit.

Micro Forge is the name to look out for in expansion boxes and Precision Software stock these products in this country. The single board adaptor and power supply will set you back over £200. The seven slot expander is £656.95. Once you've got your board, hard disk (20 Megabyted from around £1300), RAM expansion (about £1000 per Megabyte) and stereo sound digitiser can be added. An alternative 2 Megabyte expansion is that of *Comspec* which connects directly to the Amiga bus expansion port and costs £748.75.

How about a transputer – parallel processor – co-processor for your Amiga? Sophus demonstrated one attached to the *Sidecar* at an autumn show, so watch this space. Also expect the Amiga itself to be subject to 68010 and 68020 upgrades. These are not vital for normal use of the machine but will allow for even higher performance in certain application areas such as graphics workstations.

Peripheral Support

A quick look at Preferences – the Amiga configuration panel – indicated the high level of support for printer devices, including Laser. Since the Amiga's colour graphics are a vital feature, a colour printer seems the likely choice for many users. The *Epson JX* is supported but not recommended. Precision is importing Canon colour ink-jet printers and supplying them with drivers for not much more than £300. The Okimate colour ink jet is a further alternative in this price bracket. Xerox and Mitsubishi printers are being used for more serious applications.

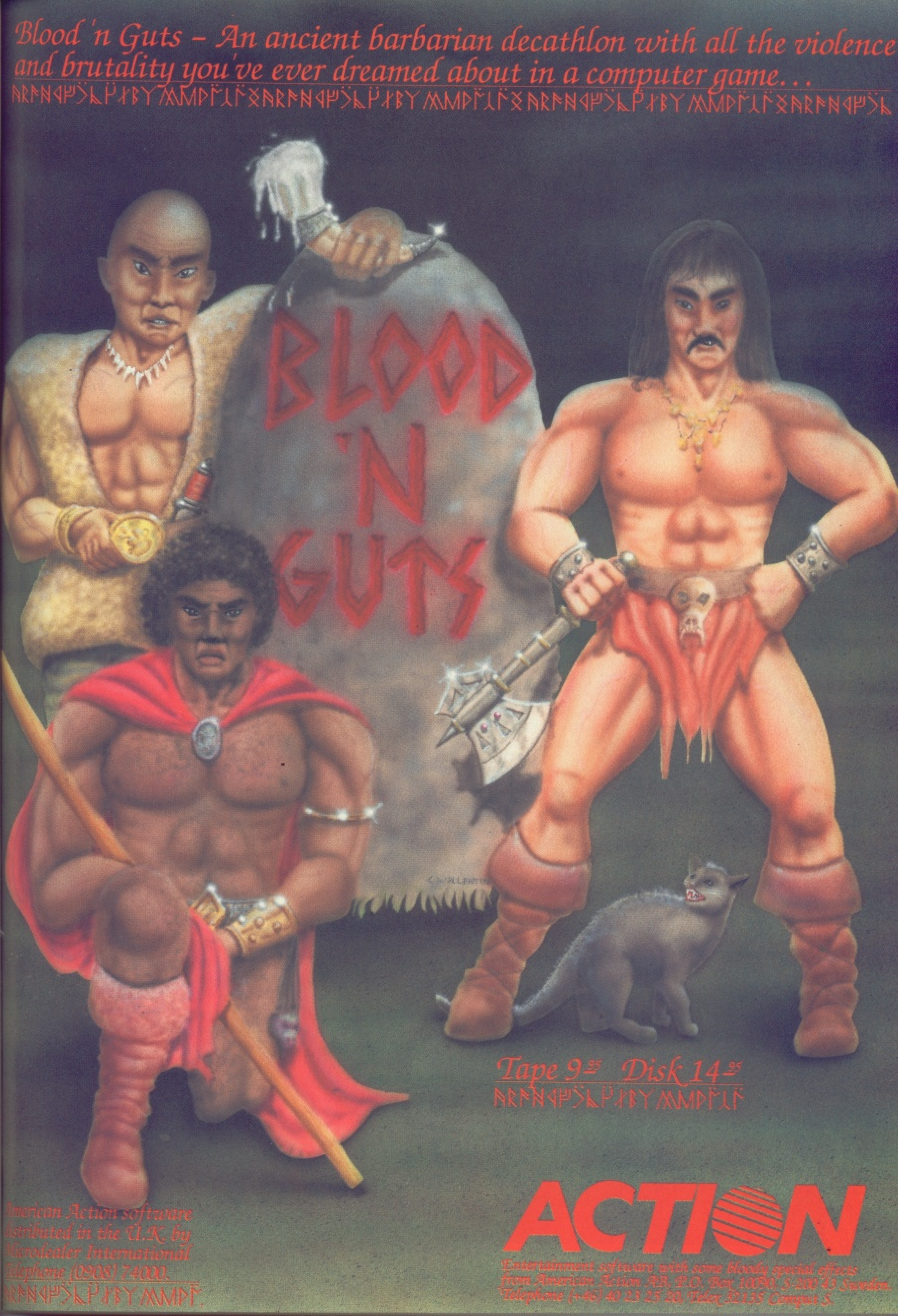
Storage can be extended via an external floppy disk drive (£249) or a hard disk unit. *AmigaDOS* is eminently suited to the hard disk option with its hierarchical structure.

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Amiga Games

The graphics potential of the Amiga gives games designers an irresistible challenge. We've reviewed some of their latest creations.

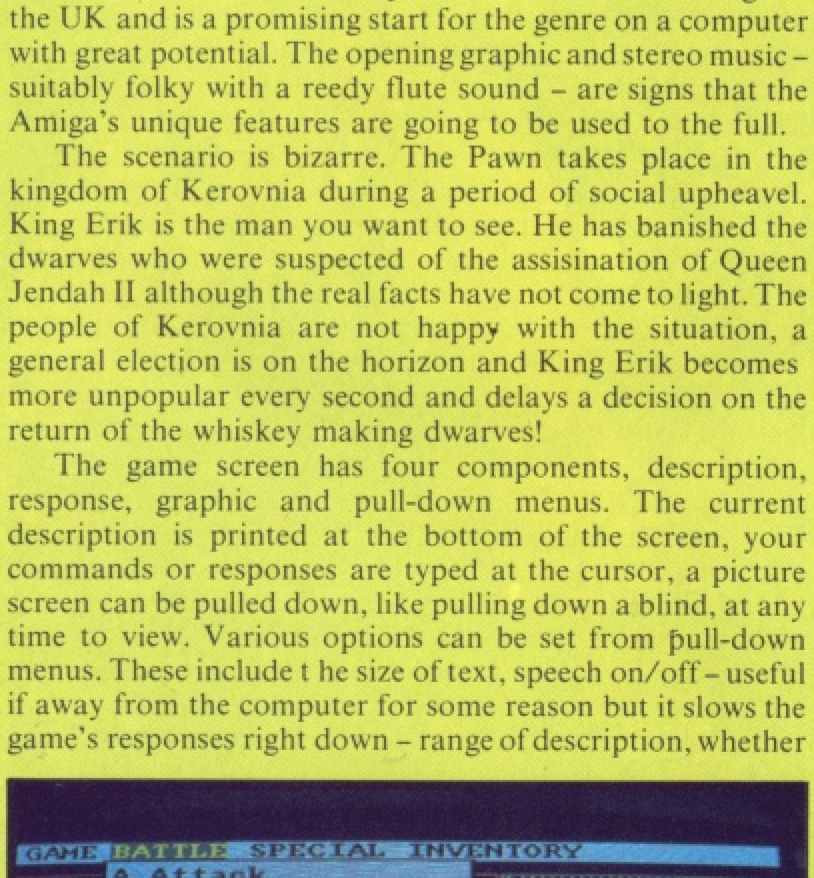
By Anne Owen

THE PAWN

The Pawn is the first major adventure for the Amiga in the UK and is a promising start for the genre on a computer with great potential. The opening graphic and stereo music – suitably folky with a reedy flute sound – are signs that the Amiga's unique features are going to be used to the full.

The scenario is bizarre. The Pawn takes place in the kingdom of Kerovnia during a period of social upheavel. King Erik is the man you want to see. He has banished the dwarves who were suspected of the assisination of Queen Jendah II although the real facts have not come to light. The people of Kerovnia are not happy with the situation, a general election is on the horizon and King Erik becomes more unpopular every second and delays a decision on the return of the whiskey making dwarves!

The game screen has four components, description, response, graphic and pull-down menus. The current description is printed at the bottom of the screen, your commands or responses are typed at the cursor, a picture screen can be pulled down, like pulling down a blind, at any time to view. Various options can be set from pull-down menus. These include t he size of text, speech on/off – useful if away from the computer for some reason but it slows the game's responses right down – range of description, whether



exits are displayed etc. The graphics display can also be turned on/off – the loading of a screen does slow the progress of the game although some of the 30 screens are very pretty.

The game also provides an eloquent set of descriptions of this magical world. Though a little twee for some tastes, the Pawn does succeed overall in casting a spell over the player, drawing him or her ever further into the surroundings and the underlying plot. If it gets too difficult there is a cypheric help feature. By typing in a long code you can get a set of three graded tips for specific locations.

The adventure itself has some interesting characters for you to meet on your quest to see the King of Kerovnia. There are the usual problems to solve in order to make progress geogrpahically. I'd place the difficulty level at medium/hard. The much heralded parser is good, a far cry from the days of noun/verb input. It's not the 'intelligent' parser you might imagine from the publicity but I've seen no better. The ability to hold conversations with other characters through the SAY command and the recognition of synonyms are both strong points in its favour.

All in all The Pawn has done well to drag me away from the more immediately appealing software for the Amiga and set me thinking a bit. There's no denying that the atmosphere of the adventure is established by the 64 page novella, the graphics and the descriptions.

It's a fairytale world, likeable enough and, if you would care to try and attack one of the palace guards, not quite as harmless and passive as it might at first seem. An adventure with hidden depths.

The faultless Rainbird presentation means that you get a prize piece of software for your money, £24.95.

Touchline

Name: *The Pawn.* ***Price:*** *£24.95.* ***Machine:*** *Amiga.* ***Supplier:*** *Rainbird.* ***Tel:*** *01 240 8837.*
Originality: *7/10.* ***Graphics:*** *8/10.* ***Playability:*** *9/10.* ***Value:*** *8/10.*



LEADER BOARD

This is by far the best looking golf simulation around in my opinion and a relaxing way to spend an evening out on the course without requiring a fluorescent ball with a radio transmitter embedded in it. As well as enjoying the game challenge, the budding young golfer could learn from Leader Board the important lessons of thinking about his/her shots, using distance charts and concentrating on technique. It is a thoroughly researched and beautifully designed game.

Once you've got the player number(s), name(s), novice/amateur/professional, course options out of the way you are presented with your golfer at the first tee. A window along the right hand side of the screen contains the variables under your control and the course information you need, par, number of shots taken and current overall score. You can click on the up and down arrows tŏ cycle through your set of clubs, no sand wedge or two wood. You have information about how far you are from the hole and in which direction the wind is blowing. The novice need not worry about the wind or indeed anything else. Generously his shot will fly fairly straight whatever the circumstances. The amateur will have to master the 'snap' – a simulation of the action of the wrists on the club at the moment of impact on the ball. This determines the 'hook' or 'slice' on the ball. Let's not be too pessimistic, it might go straight. The professional has to master the 'snap' and judge the wind.

All players have to watch the traps, the bunkers, the water and the trees. In Leaderboard the ball will come rebounding off the trunk of a tree most realistically, right down to the sound. The ball will also clunk comfortingly into the hole. You automatically come on to the green within 64 feet of the flag.

The power of your stroke is determined by the point in the backswing at which you release the held down mouse button. The direction is set by dragging a set of cross hairs to the right position. You will have to take the prevailing slope into account on the greens.

I very much enjoy playing this game. The graphics presentation is very slick, the sound a little thin on the ground. The Leaderboard updates you on your progress after each hole is completed. You can skip holes on a course, jump out of the course entirely, get a bird's eye view of the current hole and practice your driving on the driving range.

When playing with more than one player the use of the mouse is much appreciated. Leaderboard is an all round winner for those who like to test their sports' skills at the computer. Those who like a time trial challenge or shoot'em up might be put off by the gentle pace of golf. They should give Leaderboard a try, it might change their minds.

Touchline

Name: *Leader Board.* ***Price:*** *£24.95.* ***Machine:*** *Amiga.* ***Supplier:*** *US Gold.* ***Tel:*** *021 356 3388.*
Originality: *7/10.* ***Graphics:*** *9/10.* ***Playability:*** *9/10.* ***Value:*** *8/10.*

ARCTIC FOX

This is an original for the Amiga and could be described as a ground-level Skyfox. You control a rather unwieldy and slow supertank in a hostile environment. There is lots of colourful instrumentation, a superb display of controls with robot hands reflecting your flexing of the joystick or mouse and arming of weapons from the keyboard.



The three dimensional view of the world outside is nicely depicted but as you pan around it, the movement is jerky. Three dimensional rock formations and other geographical features have to be taken in your stride. A brilliant piece of simulation is achieved when Arctic Fox drives over a large object and the whole screen shakes as the tank bounces back to the ground with a loud thud. The sound of the tank engine rumbling in the background would do justice to any second world war movie.

You guide Arctic Fox around the Antarctic terrain (with its ridges, crevices, mud flats, snow fields, rocks and mountains) in search of alien installations. These include air convertors which are busily converting oxygen into the deadly mix of gases found on the aliens' native planet. The more oxygen left, the longer you have to complete the mission. Arctic Fox is swamped by swirling, agressive fighter planes, shot at by tanks and rocket launchers and tracked by floating mines. The mission is to disable your opponents by knocking out communications forts and finally winning the battle by destroying the main fort – which is very heavily defended.

Fortunately the game offers a number of playing options which can vary the difficulty from game to game. In training mode for instance you can make Arctic Fox indestructible, render your tank invisible, start/stop blizzard, smart bomb aliens in your sector etc. This is a 'pre-game' level. In the game itself there are beginner and tournament levels. At tournament level the odds are further stacked against you. You select from eight predetermined starting points and enemy configuration. The keyboard controls guided missiles, mine laying, rear view, dig in, cannon inclination, relative rverse and big screen missile.

Although exciting for the first hour of play, I'm unsure of Arctic Fox's ability to last as an interesting game for longer periods. I'm returning to it when I fancy a good cathartic punch up. Others may find the complex controls and fighting scenario a more interesting challenge. It's an impressively presented game, no doubt about that.

Touchline

Name: *Arctic Fox.* ***Price:*** *£29.95.* ***Machine:*** *Amiga.* ***Supplier:*** *Ariolasoft.* ***Tel:*** *01 836 3411.*
Originality: *6/10.* ***Graphics:*** *8/10.* ***Playability:*** *7/10.* ***Value:*** *7/10.*

CASTLES OF APSHAI

This fantasy graphic adventure is a must for the convinced role-playing fanatic and worth a look for anyone who likes a good game and a challenge. There's a lot of exploring and mapping to be done before you can say that you have really played Castle of Apshai.

You begin the game by building your own character from scratch or accepting attributes automatically assigned for you. These include strength, agility, intelligence etc. Characters can be saved and reloaded. After completing your bargaining with the innkeeper for armour, sword, bow, arrows and healing potions, it's off to the Castles of Apshai, the Upper Reaches of Apshai or the Curse of Ra. There are 12 levels of mazes and nearly 600 rooms.

The play screen consists of two windows, a display of the room you are currently in and a display of your current state of health. You can explore it for traps and secret doors. Any creatures in the room will make themselves known to you! You can move away diplomatically, try and talk them out of it or you can chance your arm and fight, losing strength in the process and possibly meeting a grim end at the hands of some weird creature.

Castles of Apshai makes good use of the Amiga's mouse and pull-down windows but this is not suitable for the speed sometimes needed to fend off a monster or run away. Play is usually carried out with one hand on the keyboard, the other on the mouse. You just click on the spot in the room to which your character should move. You can save your game position and retrieve it and so live to fight again and, hopefully, not repeat your mistakes.

Most rooms have some object to inspect, some more mysterious than others. Some prove to be just trash, others clothing, another sword perhaps or gold or some form of strength giving food. Objects can be picked up or discarded.

The 80 page booklet on the lore of Apshai – the lost culture beneath the Sahara – contains a story, advice on how to survive and full references to locations and objects to be found in the games.

If you like to explore and map a game then Apshai is three in one value for money. You'll need plenty of 'leisure time' to crack it.

Touchline

Name: *Castles of Apshai.* ***Price:*** *£24.95.* ***Machine:*** *Amiga.* ***Supplier:*** *US Gold.* ***Tel:*** *021 356 3388.*
Originality: *7/10.* ***Graphics:*** *6/10.* ***Playability:*** *7/10.* ***Value:*** *7/10.*



X-Ray Files

Take a peek inside your 1541 and find out more about what's going on with our X-ray program.

By Paul Eves

Users of the 1541 Disk Drive know already the advantages of this form of medium over the Cassette. Although the speed of the drive is something to be improved upon. (Although this is not the 1541's fault, but the operating system of the 64). However, not everyone uses their 1541 to its full potential. Indeed, most users of the 1541 don't know how the drive can be put to work for their own advantage. The program *File X-ray* sets out to show you that with a little thought on your part, you can make programming the drive a pleasure and advantageous thing to do.

When you load the direcory up, all it tells you is the name of the file and how many blocks it is, along with the program type. There are however, a few more bits and pieces of information stored in the Directory. Things like the starting address of a file. These other bits of information are known as the 'File Parameters' of a program. By understanding the make up of the directory better, these parameters can be easily found and printed to the screen or printer.

Finding Parameters

In total there are nine that we can unearth. They are:

1. File Closed?
2. File Protected?
3. Blocks Allocated
4. Side sector blocks (Relative files)
5. Data blocks (Relative files)
6. Records (Relative files)
7. Start Address (Program files)
8. Free blocks on disk
9. Allocated blocks on disk

The following program demonstrates how we find this information and then prints it to the screen of the 64 or to the printer.

Firstly, I have listed the variables used within the program, following this is the program breakdown. You should have no trouble following what's going on. The REMs may be omitted and of course you can alter the layout to suit your own personal taste.

Owners of the Vic can run the program by changing lines 16 and 17 (Screen colour set up).

Variables

RE – Track of the file entry in the directory
SE – Sector of the file entry in the directory
AF – Lower 4 bits of file type (contains the actual file type)
LO – Low byte of the start address
HI – High byte of the start address
TP – File type of requested file
NF – Not found flag if required. File on disk does not exist (set if not found)
BK – Number of blocks of file
FA – File address of program file (the start address)
LE – Length of record for relative file
DB – Track of Data Block of program file (contains start address)
DF – Sector of 1st data block of program file
FB – Free blocks on disk
AB – Allocated blocks on disk
SB – Side sectors in relative file
RF – Records in relative file
N$ – Name of requested file
FN$ – Directory file name
TY$ – File type
XX$ – Shows a closed or open file
SE$ – Shows a secure file or non secure (i.e. protected)

Program Breakdown

LINES
16 – 17 Set screen and border colours. Set cursor colour. Disable the LIST function. Disable SHIFT key. Disable RUN/STOP RESTORE. Clear screen.
18 Blank the screen.
19 – 25 Puts title screen up.
26 Switches screen back on.
27 –32 Asks if directory is to be listed. Sets NF, reads directory and returns.
33 Requests name of required file.
35 – 68 Directory read routine. Flags an error (NF) if required file not found.
78 – 81 Reads file type entry (byte zero) and stores in TP. The lower 4 bits are stored in AF.
82 – 87 Checks file type and stores string in TY$.
88 – 89 Reads bit 7 of file type byte and stores in XX$ (File closed bit).
90 – 91 Reads bit 6 of file type byte and stores in SE$ (File secure bit).
92 – 97 Reads bytes 28 and 29 of file entry and stores in BK.
98 – 102 If relative file, length of record is read from byte 21 and stored in LE.
103 – 116 Calculates the starting address in program file.
117 – 126 Calculates number of free blocks on disk.
127 – 128 Calculates side sector blocks of a relative file from LE and RF.
129 – 157 The results can now be printed either to the screen or printer.
158 – 164 Asks if another file is required.
165 – 168 Sub routines for switching screen off and on.

As it stands, the program is functional and stands alone. However, you may wish to include it as a sub-routine of a larger utility package. This can be achieved without too much trouble. You may try modifying the directory read section so that the directory is printed across the screen in two columns, instead of down the screen. Or, one which I like, is to put a four line window across the top of the screen so as not to spoil the screen layout. YC

PROGRAM: XRAY FILE

```
85  0 REM **********************
    *
4A  1 REM ** FILE XRAY PROGRAM *
    *
1C  2 REM ** COPYRIGHT (C)1986 *
    *
40  3 REM **  ESP ENTERPRISES  *
    *
DC  4 REM **   PROGRAMMED BY   *
    *
18  5 REM **    PAUL A EVES    *
    *
8F  6 REM **********************
    *
88  7 REM
87  8 REM
BC  9 REM **********************
    *
42  10 REM ** DISABLE RUN/STOP-
    **
0F  11 REM **  RESTORE AND LIST
    **
1C  12 REM ** SET BORDER/SCREEN
    **
42  13 REM **COLOURS AND DISPLAY
    **
2F  14 REM **    MAIN TITLES
    **
46  15 REM *********************
    **
35  16 CLR:PRINTCHR$(142);CHR$(8
    ):POKE792,193:POKE808,234
43  17 POKE53280,0:POKE53281,0:P
    OKE646,14:PRINT"[CLR]";
18  18 GOSUB165
5A  19 PRINT"[DOWN,SPC8,CYAN]ESP
     ENTERPRISES PRESENTS"
4A  20 PRINT"[DOWN2,SPC6,C7] FIL
    E X-RAY DISPLAY PROGRAM"
E4  21 PRINT"[SPC7,CT26]"
56  22 PRINT"[SPC3,C3][FOR COMMO
    DORE 64 PLUS 1541 DRIVE]"
AB  23 PRINT"[C7,DOWN5,SPC9]AUTH
    OR:[SPC3,YELLOW]PAUL A. EVES
    "
9B  24 PRINT"[C7,DOWN2,SPC9]TELE
    PHONE:[YELLOW][04427] 6319"
9B  25 PRINT"[WHITE,DOWN5,SPC11]
    ANY KEY TO CONTINUE[GREEN]"
35  26 GOSUB167
C5  27 WAIT198,1:POKE198,0
D5  28 PRINT"[CLR,DOWN]LIST DIRE
    CTORY:-[SPC3][[WHITE]Y[GREEN
    ]ES] [[WHITE]N[GREEN]O] OR [
    [WHITE]E[GREEN]ND]?"
13  29 GETK$:IFK$<>"Y"ANDK$<>"N"
    ANDK$<>"E"THEN29
D2  30 IFK$="Y"THENNF=1:GOSUB42
6D  31 IFK$="E"THENPRINT"[CLR]":
    END
36  32 NF=0
0E  33 INPUT"[DOWN]REQUIRED FILE
    :-";N$
64  34 IFLEN(N$)>16THENN$=LEFT$(
    N$,16)
AC  35 REM
AB  36 REM
4A  37 REM *********************
70  38 REM ** READ DIRECTORY **
70  39 REM *********************
A7  40 REM
A6  41 REM
CC  42 OPEN15,8,15,"IO":OPEN2,8,
    2,"#"
79  43 TR=18:SE=1
A5  44 PRINT#15,"B-R";2;0;TR;SE
14  45 PRINT#15,"B-P";2;0
45  46 GET#2,K$:IFK$=""THENK$=CH
    R$(0)
C5  47 TR=ASC(K$)
7F  48 GET#2,K$:IFK$=""THENK$=CH
    R$(0)
43  49 SE=ASC(K$)
11  50 FORI=0TO7
2D  51 PRINT#15,"B-P";2;I*32+5
95  52 NA$=""
4C  53 FORZ=0TO15
4D  54 GET#2,K$:IFK$=""THENK$=CH
    R$(0)
35  55 IFASC(K$)=160THEN58
7D  56 NA$=NA$+K$
15  57 NEXTZ
29  58 IFN$=NA$THEN68
79  59 IFNFTHENPRINTNA$
07  60 NEXTI
0A  61 IFTR=0THEN63
DF  62 GOTO44
EF  63 CLOSE2:CLOSE15
92  64 IFNF<>0THEN68
D7  65 IFNF=0THENPRINT"[DOWN3,C3
    ,C@8,DOWN,LEFT8,RVSON]ERROR.
    ..[RVSOFF]  [GREEN]NO SUCH F
    ILE!!!"
44  66 PRINT"[WHITE,DOWN5,SPC10]
    ANY KEY TO CONTINUE"
4D  67 WAIT198,1:POKE198,0:RUN
8C  68 IFNFTHENRETURN
CA  69 REM
C9  70 REM
90  71 REM *********************
B7  72 REM **READS AND STORES**
79  73 REM ** PARAMETERS OF   **
96  74 REM ** REQUIRED FILE   **
5C  75 REM *********************
C3  76 REM
C2  77 REM
ED  78 PRINT#15,"B-P";2;I*32+2
B0  79 GET#2,K$:IFK$=""THENK$=CH
    R$(0)
14  80 TP=ASC(K$)
5B  81 AF=TPAND15
BD  82 IFAF=0THENTY$="DELETED"
13  83 IFAF=1THENTY$="SEQUENTIAL
    "
DE  84 IFAF=2THENTY$="PROGRAM"
8B  85 IFAF=3THENTY$="USER"
AC  86 IFAF=4THENTY$="RELATIVE"
FD  87 IFAF>4THENPRINT"[C3,C@8,D
    OWN,LEFT8,RVSON]ERROR...[RVS
    OFF,GREEN] FILE TYPE NOT REC
    OGNISED!!!":GOTO66
CB  88 IFTPAND128THENXX$="YES":G
    OTO90
36  89 XX$="NO"
D4  90 IFTPAND64THENSE$="YES":GO
    TO92
EA  91 SE$="NO"
EA  92 PRINT#15,"B-P"2,I*32+30
7E  93 GET#2,K$:IFK$=""THENK$=CH
    R$(0)
01  94 LO=ASC(K$)
C0  95 GET#2,K$:IFK$=""THENK$=CH
    R$(0)
F0  96 HI=ASC(K$)*256
A2  97 BK=LO+HI
7B  98 IFAF<>4THEN102
29  99 PRINT#15,"B-P";2;I*32+23
83  100 GET#2,K$:IFK$=""THENK$=C
    HR$(0)
1A  101 LE=ASC(K$)
D4  102 IFAF<>2THEN117
BF  103 PRINT#15,"B-P";2;I*32+3
37  104 GET#2,K$:IFK$=""THENK$=C
    HR$(0)
1B  105 DB=ASC(K$)
81  106 GET#2,K$:IFK$=""THENK$=C
    HR$(0)
FD  107 DF=ASC(K$)
AE  108 OPEN3,8,3,"#"
0F  109 PRINT#15,"B-R";3;0;DB;DF

58  110 PRINT#15,"B-P";3;2
6B  111 GET#3,K$:IFK$=""THENK$=C
    HR$(0)
2F  112 LO=ASC(K$)
05  113 GET#3,K$:IFK$=""THENK$=C
    HR$(0)
2E  114 HI=ASC(K$)*256
8A  115 FA=LO+HI
07  116 CLOSE3
03  117 PRINT#15,"B-R";2;0;18;0
F0  118 FB=0
52  119 FORJ=4TO140STEP4
E8  120 IFJ=72THEN124
3A  121 PRINT#15,"B-P";2;J
D1  122 GET#2,K$:IFK$=""THENK$=C
    HR$(0)
65  123 FB=ASC(K$)+FB
48  124 NEXTJ
4B  125 AB=664-FB
D8  126 IFAF<>4THEN137
6F  127 SB=BK/121:IFSB<>INT(SB)T
    HENSB=INT(SB+1)
48  128 RF=INT(((BK-SB)*256)/LE)

2E  129 REM *********************

CF  130 REM ** ASKS FOR OUTPUT**

53  131 REM ** METHOD. SCREEN **

E0  132 REM ** OR PRINTER] AND**

71  133 REM ** DISPLAYS INFO  **

D1  134 REM *********************

08  135 REM
07  136 REM
C5  137 PRINT"[CLR,GREEN]OUTPUT
    TO [[WHITE]S[GREEN]CREEN] OR
     [[WHITE]P[GREEN]RINTER] ?"
DE  138 GETK$:IFK$<>"S"ANDK$<>"P
    "THEN138
B4  139 IFK$="S"THENOPEN1,3:PRIN
    T#1,CHR$(147):GOSUB165
D1  140 IFK$="P"THENOPEN1,4
66  141 PRINT#1,"[SPC3]PROGRAM N
    AME:[SPC7]";N$
F7  142 PRINT#1:PRINT#1:PRINT#1
0A  143 PRINT#1,"[SPC7]-:PROGRAM
     PARAMETERS:-"
AA  144 PRINT#1:PRINT#1
7D  145 PRINT#1,"[SPC3]TYPE OF F
    ILE:[SPC11]";TY$
0C  146 PRINT#1,"[SPC3]FILE CLOS
    ED:[SPC12]";XX$
CF  147 PRINT#1,"[SPC3]FILE PROT
    ECTED:[SPC9]";SE$
5D  148 PRINT#1,"[SPC3]NUMBER OF
     BLOCKS:[SPC6]";BK
A6  149 IFAF<>4THEN154
EE  150 PRINT#1,"[SPC3]RECORD LE
    NGTH:[SPC9]";LE
C0  151 PRINT#1,"[SPC3]SIDE-SECT
    OR BLOCKS:[SPC4]";SB
6B  152 PRINT#1,"[SPC3]DATA BLOC
    KS:[SPC11]";BK-SB
01  153 PRINT#1,"[SPC3]RECORDS:[
    SPC15]";RF
1C  154 IFAF=2THENPRINT#1,"[SPC3
    ]START ADDRESS:[SPC9]";FA
B5  155 PRINT#1,"[SPC3]BLOCKS AV
    AILABLE[DISK]:";FB
70  156 PRINT#1,"[SPC3]BLOCKS AL
    LOCATED[DISK]:";AB:PRINT#1:P
    RINT#1:PRINT#1
6E  157 CLOSE1
73  158 PRINT"[DOWN3,GREEN,SPC3]
    RE-RUN PROGRAM [[WHITE]Y[GRE
    EN]ES] OR [[WHITE]N[GREEN]O]
     ?
AC  159 GOSUB167
CE  160 CLOSE2:CLOSE15
EC  161 GETK$:IFK$=""THEN161
BB  162 IFK$="Y"THENGOTO0
EA  163 IFK$="N"THENPRINT"[CLR]"
    :END
99  164 GOTO161
C4  165 POKE53265,PEEK(53265)AND
    239
28  166 RETURN
AC  167 POKE53265,PEEK(53265)OR1
    6
26  168 RETURN
```

Nursery Rhyme Land

This month we bring you a column with a difference – an adventure specially written for young children with educational aims.

By Margaret and Allen Webb

In writing this adventure, we decided that it was 'put your money where your mouth is' time.

In monthly articles to date. I have been looking critically at available software and saying how they can help or hinder your child's education. I have also said that some of the programs I have seen could have been enhanced by a little thought before and during programming. This means that before any work begins at the computer, the educational aims of the program must be clearly established. The questions to be asked are:

1) What do we want to teach? This could be straight forward facts such as spelling, tables, mathematics. Or we might want to teach or develop general skills such as lateral thought and reasoning. If done well, the child need not even realise that he is being taught!
2) How are you going to present the information? It could be an arcade game, structured text or straight facts with performance testing. The range is wide. This decision is crucial and will probably need the direct input of a teacher or educationalist.
3) How can the information be effecively delivered? This is the realm of the programmer whose task is to use the full capabilities of the computer to give an attractive and stimulating program.

In summary, it is important for software houses to realise that good educational software needs the input from a number of people working in a team.

Our program

Nursery Rhyme Land is a game aimed at introducing the young user to adventures. It can be used by the early junior age child on his own but is probably best used with the help and interaction of a parent to provide help with the reading and to ask questions or give hints. The game uses well known nursery rhyme characters and the plot is related to things that happen in the rhymes. This helps test the child's knowledge and understanding of nursery rhymes.

There is no direct factual learning with this adventure, but it does test a number of skills, including reading practice, nursery rhymes, mapping and using the cardinal points of the compass, problem solving and communication skills.

My six year old loved it. He can read for himself and found it easy to make decisions as to where to go and what to do. When he had finished, he found his nursery rhyme book and reread the relevant rhymes.

I don't claim the game to be perfect, but it does contain a number of what I believe to be important features.

Entering the Program

The typing in of the adventure is rather a labour of love and you should consider buying the compilation tape or disk. The code is in two halves:

The main object code occupying locations 32000 to 40710.
The picture block occupying locations 8192 to 17176.

We'll cover the object code this month and the picture block next month.

The main control section of the adventure is the small Basic code given in Listing 1. This loader assumes that the object code is stored with the name

"OBJECT" and the picture block is saved as "PICTURE BLOCK".

You can play the adventure without pictures by replacing line 20 in LISTING 1 with:

20 POKE 16384, 96:A=4

This will enable you to play the game before you type in next month's portion.

Commencing Play

The game uses single key inputs throughout. This eliminates unnecessary complications for the younger child. The commands are:

1) N,E,S,W,U,D to move in any direction.
2) G to get an object. When G is pressed, a menu of the objects available for getting is listed. The required object is taken by pressing the appropriate number key. You may carry a maximum of four objects. If you are carrying four objects, the G command will not do anything.
3) L to leave an object. This time, a menu of the objects carried out displayed. Again, you select the object to leave by pressing the relevant number key.
4) Q will leave the program and offer game Save/Load options or help. The help command will return you to the game at the same place that you left it.

Object of the Game

The aim of the game is to locate Bo Peep's sheep which have been stolen by a nasty witch. To find them, you must obtain certain objects. Some can be found simply by exploring, others can only be obtained by helping people. All interactions are handled automatically. If, for example, you were to meet Simple Simon and you were carrying a penny, something would happen.

That's all the help you get, the rest is up to you or your children. YC

PROGRAM: LISTING 1

```
88  1 REM**************************
50  2 REM*LISTING 1 *
6A  3 REM*NURSERY RHYME LAND BOOT*
44  4 REM*A + M 1986 *
84  5 REM**************************
F0  10 IFA=0THEN  POKE56,32:CLR
BB  20 A=A+1:IFA=1THENGOSUB400:A=A+1
2E  30 IFA=2THENLOAD"OBJECT",8,1
5B  40 IFA=3THENLOAD"PICTURE BLOCK",8,1
82  50 IFA=5THENLOADFI$,DE,1
98  60 IFA=6THEN210
37  70 IFA=4THENGOSUB470
83  80 SYS32000
D5  90 PRINT"[CLR,C8]DO YOU WANT TO SAVE OR LOAD A GAME OR[SPC3]HAVE HELP":POKE53269,0
E8  100 INPUT "[RVSON]YES[RVSOFF] OR [RVSON]NO[RVSOFF] OR [RVSON]HELP[RVSOFF]";I$
4B  110 IFLEFT$(I$,1)="N"THENEND
F4  120 IFLEFT$(I$,1)="H"THENGOSUB470:GOTO260
DA  130 INPUT "[CLR,RVSON]SAVE[RVSOFF] OR [RVSON]LOAD[RVSOFF]";I$:A$=LEFT$(I$,1)
0E  140 IFA$<>"S"ANDA$<>"L"THEN130
9F  150 INPUT"[CLR]FILE NAME";FI$
13  160 INPUT "[RVSON]DISK DRIVE[RVSOFF] OR [RVSON]CASSETTE DECK[RVSON]";DE$:D$=LEFT$(DE$,1)
9F  170 IFD$<>"D"ANDD$<>"C"THEN160
80  180 DE=8:IFD$="C"THENDE=1
58  190 IFA$="S"THEN280
C6  200 A=5:GOTO50
38  210 SA=12*4096
E1  220 POKE830,PEEK(SA)
8C  230 POKE872,PEEK(SA+1)
7D  240 FORI=0TO13:POKE39797+I,PEEK(SA+2+I):NEXT
B9  250 FORI=0TO9:POKE39826+I,PEEK(SA+16+I):NEXT
53  260 SYS32016
8F  270 GOTO90
8F  280 SA=12*4096
4C  290 POKESA,PEEK(830)
D3  300 POKESA+1,PEEK(872)
60  310 FORI=0TO13:POKESA+2+I,PEEK(39797+I):NEXT
61  320 FORI=0TO9:POKESA+16+I,PEEK(39826+I):NEXT
4B  330 SA=SA:FA=SA+26:GOSUB350
24  340 GOTO80
4B  350 POKE194,SA/256:POKE193,SA-PEEK(194)*256
1C  360 POKE175,FA/256:POKE174,FA-PEEK(175)*256
6A  370 L=LEN(FI$)
ED  380 FORI=1TOL:POKE1023+I,ASC(MID$(FI$,I,1)):NEXT
30  390 POKE 187,0:POKE188,4:POKE183,L:POKE186,DE:SYS62954:RETURN
46  400 POKE53280,0:POKE53281,0
81  410 PRINT"[CLR,DOWN6]"TAB(12)"[YELLOW]NURSERY-RHYME LAND"
61  420 PRINT"[DOWN3]"TAB(8)"[CYAN]AN ADVENTURE FOR CHILDREN"
AD  430 PRINT"[DOWN2]"TAB(9)"[WHITE]GAME CONCEPT AND DESIGN"
A6  440 PRINT"[DOWN]"TAB(12)"BY MARGARET WEBB"
22  450 PRINT"[DOWN2]"TAB(9)"[GREEN]PROGRAMMED BY ALLEN WEBB"
43  460 RETURN
BA  470 PRINT"[C8,CLR]ALL COMMANDS USE SINGLE KEY PRESSES."
21  480 PRINT"[DOWN2]TO MOVE IN ANY DIRECTIONS YOU USE:"
1F  490 PRINT"[DOWN,SPC11,YELLOW,RVSON]N[RVSOFF,C8,SPC3]TO MOVE NORTH"
46  500 PRINT"[DOWN,SPC11,YELLOW,RVSON]E[RVSOFF,C8,SPC3]TO MOVE EAST "
68  510 PRINT"[DOWN,SPC11,YELLOW,RVSON]S[RVSOFF,C8,SPC3]TO MOVE SOUTH"
FF  520 PRINT"[DOWN,SPC11,YELLOW,RVSON]W[RVSOFF,C8,SPC3]TO MOVE WEST"
F1  530 PRINT"[DOWN,SPC11,YELLOW,RVSON]D[RVSOFF,C8,SPC3]TO MOVE DOWN"
FB  540 PRINT"[DOWN,SPC11,YELLOW,RVSON]U[RVSOFF,C8,SPC3]TO MOVE UP  "
12  550 GOSUB 700
47  560 PRINT"[CLR,C8]PRESS [RVSON,YELLOW]G[RVSOFF,C8] TO GET AN OBJECT"
41  570 PRINT"[DOWN]IF THERE ARE OBJECTS YOU CAN TAKE, YOU WILL BE GIVEN A LIST."
17  580 PRINT"[DOWN]TO TAKE AN OBJECT, PRESS THE NUMBER OF IT IN THE LIST."
8B  590 PRINT"[DOWN]FOR EXAMPLE, IF YOU ARE AT A LOCATION[SPC3]WITH A GUN AND A BOX";
38  600 PRINT" PRESENT, YOU WILL GET THE LIST:"
A7  610 PRINT"[DOWN,SPC12]1. GUN"
EE  620 PRINT"[SPC12]2. BOX"
70  630 PRINT"[DOWN2]YOU JUST PRESS [RVSON,YELLOW]1[C8,RVSOFF] TO TAKE THE GUN OR [RVSON,YELLOW]2[RVSOFF,C8] TOTAKE THE BOX."
A6  640 GOSUB700
9C  650 PRINT"[C8,CLR]TO DROP AND OBJECT PRESS [RVSON,YELLOW]L[RVSOFF,C8]. YOU WILL BE GIVEN A LIST OF THE";
85  660 PRINT" THINGS YOU MAY DROP."
D0  670 PRINT"[DOWN]YOU THEN PRESS THE NUMBER OF THE OBJECT YOU WANT TO DROP.[DOWN]"
A1  680 PRINT"PRESS [RVSON,YELLOW]Q[RVSOFF,C8] TO LEAVE THE GAME OR TO SAVE OR LOAD A GAME OR FOR HELP."
DB  690 GOSUB700:RETURN
EC  700 PRINT"[DOWN2,SPC7,RVSON,C1]PRESS ANY KEY TO CONTINUE"
2D  710 GETI$:IFI$=""THEN710
5C  720 RETURN

READY.
```

PROGRAM: OBJECT

Use HEX DATA ENTRY program to enter this listing

```
7D00 A9 00 8D 20 D0 8D 21 D0 :95
7D08 A9 0F 8D 86 02 20 30 7D :90
7D10 20 46 7F 20 1F 7E 20 B1 :30
7D18 7F 20 9C 9E 20 11 7F AC :02
7D20 45 03 B9 34 7F 85 FB B9 :A4
7D28 30 7F 85 FC 6C FB 00 60 :E0
7D30 A9 01 8D 3E 03 A9 00 8D :E7
7D38 68 03 A0 00 B9 83 9B 99 :3A
7D40 74 9B C8 CC 82 9B D0 F4 :EE
7D48 A0 00 B9 A5 9B 99 9B 9B :59
7D50 A9 01 99 91 9B C8 C0 0A :51
7D58 D0 F0 A9 00 8D BE 9B 8D :C8
7D60 CD 9B 8D F7 9B 60 AC 3E :BC
7D68 03 88 B9 1F 99 85 FB B9 :E2
7D70 54 99 85 FC AC 45 03 B1 :0C
7D78 FB D0 06 20 48 9A 4C 1C :9D
7D80 7D 8D 3E 03 20 46 7F 20 :9A
7D88 1F 7E A9 05 20 D2 FF 20 :37
7D90 19 80 20 88 9A 20 81 7F :6A
7D98 20 9C 9E 4C 1C 7D AD 3E :1F
7DA0 03 8D 67 03 AD 68 03 C9 :2C
7DA8 04 B0 08 20 D5 7E AD 85 :A4
7DB0 03 D0 03 4C 1C 7D A9 93 :3D
7DB8 20 D2 FF A9 28 A0 9A 20 :DB
7DC0 1E AB A9 00 8D 15 D0 20 :1E
7DC8 85 7E 20 EF 7E AC 85 03 :9E
7DD0 B9 52 03 A8 A9 00 99 74 :F2
7DD8 9B EE 68 03 4C 10 7D 60 :DA
7DE0 A9 00 8D 67 03 AD 68 03 :D9
7DE8 F0 08 20 D5 7E AD 85 03 :DB
7DF0 D0 03 4C 1C 7D A9 93 20 :86
7DF8 D2 FF A9 38 A0 9A 20 1E :2F
7E00 AB A9 00 8D 15 D0 20 85 :82
7E08 7E 20 EF 7E AC 85 03 B9 :E2
7E10 52 03 A8 AD 3E 03 99 74 :2B
7E18 9B CE 68 03 4C 10 7D A9 :22
7E20 00 8D 84 03 A9 00 AA A8 :05
7E28 B9 74 9B CD 3E 03 F0 07 :DE
7E30 C8 CC 82 9B D0 F2 60 A9 :26
7E38 17 A0 9A 20 1E AB A0 00 :D5
7E40 B9 74 9B CD 3E 03 F0 09 :06
7E48 C8 CC 82 9B D0 F2 4C 7F :62
7E50 7E B9 4A 9B 18 6D 84 03 :44
7E58 C9 1A B0 18 8D 84 03 B9 :7B
7E60 58 9B AA B9 66 9B 8C 85 :6C
7E68 03 A8 8A 20 1E AB AC 85 :4D
7E70 03 4C 48 7E A9 0D 20 D2 :E6
7E78 FF B9 4A 9B 4C 5C 7E A9 :91
7E80 0D 20 D2 FF 60 A9 00 A8 :55
7E88 8D 66 03 8C 84 03 B9 74 :6F
7E90 9B CD 67 03 F0 07 C8 CC :B8
7E98 82 9B D0 F2 60 8C 85 03 :6B
7EA0 EE 66 03 98 AC 66 03 99 :60
7EA8 52 03 98 18 69 30 20 D2 :C5
7EB0 FF A9 20 20 D2 FF AC 85 :D1
7EB8 03 B9 58 9B AA B9 66 9B :EB
7EC0 A8 BA 20 1E AB A9 14 20 :2D
7EC8 D2 FF A9 0D 20 D2 FF AC :AC
7ED0 85 03 4C 96 7E A0 00 8C :2D
7ED8 85 03 B9 74 9B CD 67 03 :1C
7EE0 F0 07 C8 CC 82 9B D0 F2 :D2
7EE8 60 A9 01 8D 85 03 60 20 :1C
7EF0 E4 FF C9 00 F0 F9 AA AD :C1
7EF8 66 03 18 69 31 8D 85 03 :4E
7F00 8A C9 30 90 EA CD 85 03 :07
7F08 B0 E5 38 E9 30 8D 85 03 :C7
7F10 60 20 E4 FF C9 00 F0 F9 :9D
7F18 A0 00 D9 28 7F F0 08 C8 :82
7F20 C0 09 D0 F6 4C 11 7F 8C :F5
7F28 45 03 60 4E 45 53 57 55 :1F
7F30 44 4C 47 51 66 66 66 66 :81
7F38 66 66 E0 9E DF 7D 7D 7D :1E
7F40 7D 7D 7D 7D 7D 7D A9 93 :BB
7F48 20 D2 FF 20 00 40 A9 13 :40
7F50 20 D2 FF A9 F1 A0 99 20 :59
7F58 1E AB AC 3E 03 88 B9 77 :CE
7F60 97 AA B9 AC 97 A8 8A 20 :CF
7F68 1E AB A9 0D 20 D2 FF AD :F8
7F70 94 9B F0 0C AD 96 9B D0 :DC
7F78 07 A9 9D A0 82 20 1E AB :9C
7F80 60 A9 0D 20 D2 FF A0 99 :15
7F88 A9 AD 20 1E AB AC 3E 03 :8C
7F90 88 B9 1F 99 85 FB B9 54 :75
7F98 99 85 FC A0 00 8C E8 03 :67
7FA0 B1 FB 8D 3F 03 F0 07 A9 :12
7FA8 89 A0 99 20 1E AB EE E8 :16
7FB0 03 AC E8 03 B1 FB 8D 40 :01
7FB8 03 F0 07 A9 90 A0 99 20 :13
7FC0 1E AB EE E8 03 AC E8 03 :25
7FC8 B1 FB 8D 41 03 F0 07 A9 :42
7FD0 96 A0 99 20 1E AB EE E8 :4B
7FD8 03 AC E8 03 B1 FB 8D 42 :39
7FE0 03 F0 07 A9 9D A0 99 20 :7C
7FE8 1E AB EE E8 03 AC E8 03 :4D
7FF0 B1 FB 8D 43 03 F0 07 A9 :72
7FF8 A3 A0 99 20 1E AB EE E8 :80
8000 03 AC E8 03 B1 FB 8D 44 :71
8008 03 F0 07 A9 A7 A0 99 20 :D6
8010 1E AB A9 0D 20 D2 FF 60 :38
8018 60 AD 3E 03 C9 26 D0 21 :21
8020 AD 79 9B D0 19 A9 FF 8D :A4
8028 79 9B A9 00 8D 7B 9B A9 :FA
8030 DE A0 81 20 1E AB A9 00 :88
8038 8D 98 9B 4C CF 81 4C CF :93
8040 81 C9 1D D0 14 AD 96 9B :4E
8048 F0 F4 A9 00 8D 96 9B A9 :E5
8050 40 A0 82 20 1E AB 4C CF :FA
8058 81 C9 07 D0 24 AD 96 9B :74
8060 D0 1C AD 94 9B F0 B1 A9 :85
8068 00 8D 94 9B A9 C2 A0 82 :F3
8070 20 1E AB A9 00 8D 79 9B :E6
8078 EE 68 03 4C CF 81 4C CF :0C
8080 81 C9 08 D0 1C AD 7B 9B :BA
8088 D0 F4 A9 00 8D 93 9B 8D :13
8090 7A 9B A9 FF 8D 7B 9B A9 :5F
8098 1D A0 83 20 1E AB 4C 7E :9A
80A0 80 C9 1A D0 23 AD 7A 9B :2B
80A8 D0 D4 A9 FF 8D 7A 9B A9 :39
80B0 00 8D 7C 9B 8D 99 9B A9 :B6
80B8 34 A0 9E 20 1E AB A9 7E :AD
80C0 A0 83 20 1E AB 4C EF 80 :E6
80C8 C9 12 D0 23 AD 7E 9B D0 :C3
80D0 AD A9 FF 8D 7E 9B A9 00 :B7
80D8 8D 77 9B 8D 91 9B A9 C3 :86
80E0 A0 9B 20 1E AB A9 A1 A0 :42
80E8 83 20 1E AB 4C CF 81 C9 :D6
80F0 16 D0 26 AD 77 9B F0 03 :69
80F8 4C 7E 80 A9 FF 8D 77 9B :C6
8100 A9 00 8D 78 9B 8D 92 9B :5B
8108 A9 F4 A0 9B 20 1E AB A9 :2E
8110 05 A0 84 20 1E AB 4C CF :85
8118 81 C9 25 D0 1F AD 78 9B :A3
8120 F0 03 4C CF 81 A9 FF 8D :12
8128 78 9B CE 68 03 A9 27 8D :5E
8130 BE 9B A9 70 A0 84 20 1E :E1
8138 AB 4C CF 81 C9 24 D0 1F :59
8140 AD 75 9B F0 03 4C CF 81 :F0
8148 A9 FF 8D 75 9B CE 68 03 :35
8150 A9 00 8D 97 9B A9 B4 A0 :E5
8158 84 20 1E AB 4C CF 81 C9 :47
8160 1F D0 23 AD 7C 9B D0 67 :32
8168 A9 FF 8D 7C 9B A9 00 8D :0B
8170 7D 9B 8D 95 9B A9 17 A0 :BC
8178 9D 20 1E AB A9 0E A0 85 :84
8180 20 1E AB 4C CF 81 C9 28 :DD
8188 D0 1C AD 7D 9B D0 40 A9 :7A
8190 FF 8D 7D 9B CE 68 03 A9 :5F
8198 55 A0 85 20 1E AB A9 29 :BB
81A0 8D CD 9B 4C CF 81 C9 2F :C7
81A8 D0 26 AD 76 9B D0 20 AD :D2
81B0 9A 9B F0 1B A9 00 8D 9A :B4
81B8 9B A9 31 8D F7 9B A9 61 :76
81C0 A0 9E 20 1E AB A9 85 A0 :64
81C8 85 20 1E AB 4C CF 81 60 :70
81D0 C9 35 D0 FB A9 E5 A0 85 :92
81D8 20 1E AB 4C DB 81 59 4F :99
81E0 55 20 4D 45 45 54 20 53 :39
81E8 49 4D 50 4C 45 20 53 49 :91
81F0 4D 4F 4E 2E 0D 53 49 4D :17
81F8 4F 4E 20 54 41 4B 45 53 :15
8200 20 59 4F 55 52 20 50 45 :C5
8208 4E 4E 59 20 41 4E 44 0D :DA
8210 53 41 59 53 20 54 48 41 :D4
8218 4E 4B 59 4F 55 2E 20 48 :20
8220 45 20 47 49 56 45 53 20 :2F
8228 59 4F 55 20 41 0D 41 20 :F8
8230 52 49 4E 47 20 49 4E 20 :92
8238 52 45 54 55 52 4E 0D 00 :2D
8240 53 4F 4D 45 20 53 4F 4C :47
8248 44 49 45 52 53 20 41 52 :EB
8250 45 20 48 45 52 45 20 46 :09
8258 49 53 48 49 4E 47 2E 0D :1D
8260 54 48 45 59 20 53 45 45 :14
8268 20 59 4F 55 20 41 4E 44 :E3
8270 20 41 53 4B 20 49 46 20 :77
8278 54 48 45 59 0D 4D 41 59 :2D
8280 20 57 41 4C 4B 20 57 49 :21
8288 54 48 20 59 4F 55 2E 20 :FB
8290 59 4F 55 20 53 41 59 20 :9A
8298 59 45 53 0D 00 53 4F 4D :2B
82A0 45 20 53 4F 4C 44 49 45 :95
82A8 52 53 20 41 52 45 20 57 :D4
82B0 41 4C 4B 49 4E 47 20 57 :56
82B8 49 54 48 20 59 4F 55 2E :5B
82C0 0D 00 54 48 45 20 44 55 :86
82C8 4B 45 20 4F 46 20 59 4F :3E
82D0 52 4B 20 49 53 20 50 4C :2B
82D8 45 41 53 45 44 0D 54 4F :12
82E0 20 53 45 45 20 54 48 41 :21
82E8 54 20 59 4F 55 20 48 41 :2C
82F0 56 45 20 46 4F 55 4E 44 :13
82F8 20 48 49 53 0D 53 4F 4C :8B
8300 44 49 45 52 53 2E 20 48 :C0
8308 45 20 47 49 56 45 53 20 :17
8310 59 4F 55 20 41 20 50 45 :E3
8318 4E 4E 59 0D 00 54 48 45 :59
8320 20 4C 41 44 59 20 4F 4E :C1
8328 20 54 48 45 20 48 4F 52 :E5
8330 53 45 20 49 53 0D 48 41 :7E
8338 50 50 59 20 54 4F 20 53 :A9
8340 45 45 20 54 48 41 54 20 :F9
8348 59 4F 55 20 48 41 56 45 :2E
8350 0D 46 4F 55 4E 44 20 48 :6B
8358 45 52 20 52 49 4E 47 2E :8B
8360 20 53 48 45 20 47 49 56 :0B
8368 45 53 20 59 4F 55 0D 41 :03
8370 20 42 41 47 20 4F 46 20 :57
8378 47 4F 4C 44 0D 00 59 4F :79
8380 55 20 42 55 59 20 41 20 :73
8388 42 49 47 20 50 49 45 20 :DA
8390 57 49 54 48 0D 59 4F 55 :BD
8398 52 20 47 4F 4C 44 2E 0D :F9
83A0 00 59 4F 55 20 47 49 56 :8C
83A8 45 20 4D 41 52 59 20 54 :48
83B0 48 45 20 53 49 4C 56 45 :E5
83B8 52 0D 42 45 4C 4C 20 46 :52
83C0 4F 52 20 48 45 52 20 47 :90
83C8 41 52 44 45 4E 2E 0D 4D :EA
83D0 41 52 59 20 47 49 56 45 :DB
83D8 53 20 59 4F 55 20 41 20 :E2
83E0 42 4F 4E 45 0D 57 48 49 :49
83E8 43 48 20 53 48 45 20 48 :8D
83F0 41 53 20 46 4F 55 4E 44 :1A
83F8 20 49 4E 0D 47 41 52 44 :0F
8400 45 4E 2E 0D 00 59 4F 55 :86
```

```
8408 20 47 49 56 45 20 54 48 :8E
8410 45 20 42 4F 4E 45 20 54 :3B
8418 4F 0D 4D 4F 54 48 45 52 :6B
8420 20 48 55 42 42 41 52 44 :05
8428 53 20 44 4F 47 2E 0D 4D :FD
8430 4F 54 48 45 52 20 48 55 :0D
8438 42 42 41 52 44 20 47 49 :56
8440 56 45 53 20 59 4F 55 0D :EB
8448 41 20 4C 41 44 44 45 52 :10
8450 2E 20 53 48 45 20 53 41 :3D
8458 59 53 20 49 54 0D 4D 49 :30
8460 47 48 54 20 42 45 20 55 :23
8468 53 45 46 55 4C 2E 0D 00 :56
8470 59 4F 55 20 50 55 54 20 :C0
8478 59 4F 55 52 20 4C 41 44 :05
8480 44 45 52 0D 44 4F 57 4E :77
8488 20 54 48 45 20 57 45 4C :29
8490 4C 2E 20 59 4F 55 20 43 :7D
8498 41 4E 20 4E 4F 57 0D 47 :35
84A0 4F 20 44 4F 57 4E 20 49 :E6
84A8 46 20 59 4F 55 20 57 49 :87
84B0 53 48 0D 00 4A 41 43 4B :DF
84B8 20 41 4E 44 20 4A 49 4C :0F
84C0 4C 20 54 41 4B 45 20 54 :E1
84C8 48 45 20 42 55 43 4B 45 :72
84D0 54 20 41 4E 44 20 54 48 :FF
84D8 41 4E 4B 0D 59 4F 55 2E :24
84E0 20 54 48 45 59 20 54 45 :85
84E8 4C 4C 20 59 4F 55 20 54 :99
84F0 4F 20 41 4C 57 41 59 53 :B2
84F8 20 42 45 20 48 49 4E 44 :5A
8500 0D 54 4F 20 41 4E 49 4D :A2
8508 41 4C 53 2E 0D 00 54 48 :5F
8510 45 20 4F 4C 44 20 4C 41 :E2
8518 44 59 20 49 53 20 44 45 :F5
8520 4C 49 47 48 54 45 44 0D :79
8528 57 49 54 48 20 59 4F 55 :B4
8530 52 20 50 49 45 2E 20 53 :BB
8538 48 45 20 47 49 56 45 53 :72
8540 0D 59 4F 55 20 41 20 57 :FE
8548 4F 4F 44 45 4E 20 50 4C :EB
8550 41 4E 4B 0D 00 59 4F 55 :29
8558 20 50 55 54 20 54 48 45 :1F
8560 20 50 4C 41 4E 4B 20 4F :A8
8568 56 45 52 20 54 48 45 20 :F5
8570 53 54 52 45 41 4D 20 41 :70
8578 53 0D 41 20 42 52 49 44 :7D
8580 47 45 2E 0D 00 59 4F 55 :F6
8588 20 50 55 4C 4C 20 4F 55 :84
8590 54 20 54 48 45 20 44 52 :C5
8598 41 47 4F 4E 27 53 20 53 :B9
85A0 4F 52 45 20 54 4F 4F 54 :29
85A8 48 0D 57 49 54 48 20 59 :2F
85B0 4F 55 52 20 50 49 4E 43 :9F
85B8 45 52 53 2E 20 54 48 45 :0A
85C0 20 44 52 41 47 4F 4E 20 :C1
85C8 52 4F 41 52 53 0D 48 41 :B0
85D0 50 50 49 4C 59 20 41 4E :7F
85D8 44 20 57 41 4C 4B 53 20 :E8
85E0 4F 46 46 0D 00 57 45 4C :0E
85E8 4C 20 44 4F 4E 45 20 59 :48
85F0 4F 55 20 48 41 56 45 20 :95
85F8 46 49 4E 49 53 48 45 44 :30
8600 20 54 48 45 20 47 41 4D :2D
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9518 55 4C 20 59 4F 55 20 44 :52
9520 4F 4E 27 54 20 47 45 54 :9D
9528 20 4C 4F 53 54 2E 0D 00 :2C
9530 49 4E 20 41 20 43 41 56 :22
9538 45 20 57 49 54 48 20 4D :82
9540 41 4E 59 20 54 57 49 53 :ED
9548 54 49 4E 47 20 20 20 20 :74
9550 50 41 53 53 41 47 45 53 :D1
9558 2E 0D 42 45 20 43 41 52 :03
9560 45 46 55 4C 20 59 4F 55 :E7
9568 20 44 4F 4E 27 54 20 47 :08
9570 45 54 20 4C 4F 53 54 2E :26
9578 0D 00 49 4E 20 41 20 43 :B6
9580 41 56 45 20 57 49 54 48 :B1
9588 20 4D 41 4E 59 20 54 57 :BE
9590 49 53 54 49 4E 47 20 20 :AF
9598 20 20 50 41 53 53 41 47 :7C
95A0 45 53 2E 0D 42 45 20 43 :29
95A8 41 52 45 46 55 4C 20 59 :8D
95B0 4F 55 20 44 4F 4E 27 54 :29
95B8 20 47 45 54 20 4C 4F 53 :AE
95C0 54 2E 0D 00 49 4E 20 41 :C0
95C8 20 43 41 56 45 20 57 49 :4B
95D0 54 48 20 4D 41 4E 59 20 :D0
95D8 54 57 49 53 54 49 4E 47 :B5
95E0 20 20 20 20 50 41 53 53 :13
95E8 41 47 45 53 2E 0D 42 45 :FC
95F0 20 43 41 52 45 46 55 4C :51
95F8 20 59 4F 55 20 44 4F 4E :DC
9600 27 54 20 47 45 54 20 4C :DC
9608 4F 53 54 2E 0D 00 49 4E :61
9610 20 41 20 43 41 56 45 20 :4A
9618 57 49 54 48 20 4D 41 4E :C2
9620 59 20 54 57 49 53 54 49 :04
9628 4E 47 20 20 20 20 50 41 :7C
9630 53 53 41 47 45 53 2E 0D :FD
9638 42 45 20 43 41 52 45 46 :B4
9640 55 4C 20 59 4F 55 20 44 :7A
9648 4F 4E 27 54 20 47 45 54 :C5
9650 20 4C 4F 53 54 2E 0D 00 :54
9658 49 4E 20 41 20 43 41 56 :4A
9660 45 20 57 49 54 48 20 4D :AA
9668 41 4E 59 20 54 57 49 53 :15
9670 54 49 4E 47 20 20 20 20 :9C
9678 50 41 53 53 41 47 45 53 :F9
9680 2E 0D 42 45 20 43 41 52 :2B
9688 45 46 55 4C 20 59 4F 55 :0F
9690 20 44 4F 4E 27 54 20 47 :30
9698 45 54 20 4C 4F 53 54 2E :4E
96A0 0D 00 49 4E 20 41 20 43 :DE
96A8 41 56 45 20 57 49 54 48 :D9
96B0 20 4D 41 4E 59 20 54 57 :E6
96B8 49 53 54 49 4E 47 20 20 :D7
96C0 20 20 50 41 53 53 41 47 :A4
96C8 45 53 2E 0D 42 45 20 43 :51
96D0 41 52 45 46 55 4C 20 59 :B5
96D8 4F 55 20 44 4F 4E 27 54 :51
96E0 20 47 45 54 20 4C 4F 53 :D6
96E8 54 2E 0D 00 49 4E 20 41 :EB
96F0 20 4E 41 52 52 4F 57 20 :8C
96F8 50 41 53 53 41 47 45 2E :51
9700 20 54 48 45 52 45 20 49 :14
9708 53 20 20 20 41 20 57 41 :E9
9710 59 20 4F 55 54 20 54 4F :12
9718 20 54 48 45 20 53 4F 55 :2F
9720 54 48 2E 0D 00 49 4E 20 :9A
9728 41 20 47 52 45 45 4E 20 :DF
9730 46 49 45 4C 44 2E 20 49 :97
9738 20 43 41 4E 20 53 45 45 :76
9740 0D 42 4F 20 50 45 45 50 :CF
9748 27 53 20 53 48 45 45 50 :2A
9750 2E 20 53 48 45 20 57 49 :99
9758 4C 4C 20 42 45 20 48 41 :BD
9760 50 50 59 20 54 4F 0D 47 :EC
9768 45 54 20 54 48 45 4D 20 :26
9770 42 41 43 4B 2E 0D 00 0B :B5
9778 A5 28 C3 7D 30 C5 5D E1 :D1
9780 87 E0 3C 7D A9 F7 38 94 :AE
9788 1C 70 F3 31 71 CF 23 6F :9D
9790 A5 DB 11 22 6B A1 B0 F9 :1B
9798 22 7A D7 02 2F 7A A0 E0 :62
97A0 20 60 9C E6 30 7A C4 0E :84
97A8 58 A2 EC 25 86 86 87 87 :47
97B0 88 89 89 8A 8A 8B 8B 8C :2E
97B8 8C 8C 8C 8D 8D 8E 8E 8E :9B
97C0 8F 8F 8F 90 90 90 90 91 :02
97C8 91 91 91 91 91 92 92 92 :41
97D0 93 93 93 93 93 94 94 94 :91
97D8 94 95 95 95 96 96 96 96 :E5
97E0 97 00 00 00 02 00 00 03 :99
97E8 01 26 00 00 00 04 00 02 :5D
97F0 00 00 00 08 05 03 00 00 :3B
97F8 00 00 06 00 04 00 00 00 :1E
9800 07 00 05 00 00 00 00 00 :16
9808 06 00 00 10 09 04 19 00 :42
9810 00 00 0A 00 0B 00 00 00 :56
9818 0B 00 09 00 00 0E 0C 00 :E6
9820 0A 00 00 0D 00 00 0B 00 :AB
9828 00 0F 0F 0C 0E 00 00 0F :61
9830 0D 0B 00 00 00 00 0D 0D :16
9838 0E 00 00 11 00 08 00 00 :BA
9840 00 18 12 10 00 00 00 00 :E6
9848 13 00 11 00 00 14 16 15 :48
9850 12 00 00 00 00 13 00 00 :D4
9858 00 13 00 00 00 00 00 17 :36
9860 00 00 13 00 00 00 00 16 :49
9868 00 00 00 00 00 11 00 00 :CE
9870 00 00 08 00 1A 00 00 00 :0A
9878 19 18 00 00 00 1A 1C 1E :17
9880 1D 00 00 00 00 1F 1B 00 :14
9888 00 00 1B 20 00 00 00 1B :31
9890 1F 21 20 00 00 1C 00 22 :09
9898 1E 00 00 1D 1E 00 00 00 :C0
98A0 00 1E 00 00 00 00 00 1F :D4
98A8 00 23 00 00 00 22 00 00 :BA
98B0 24 00 00 00 23 00 25 00 :86
98B8 00 00 24 00 00 00 00 02 :34
98C0 00 28 00 00 00 00 00 00 :10
98C8 00 25 00 26 00 29 00 00 :A0
98D0 00 28 2A 00 00 00 00 2B :F6
98D8 00 00 29 00 00 00 2C 2A :D7
98E0 00 00 00 00 2D 00 2B 00 :EE
98E8 00 00 30 2E 2C 00 00 2D :74
98F0 2F 2E 2E 00 00 30 30 00 :75
98F8 2E 00 00 00 2F 2F 2D 00 :66
9900 00 2F 33 32 32 00 00 31 :41
9908 33 00 31 00 00 31 00 34 :94
9910 32 00 00 33 00 35 00 00 :4C
9918 00 34 00 00 00 00 00 E1 :88
9920 E7 ED F3 F9 FF 05 0B 11 :8C
9928 17 1D 23 29 2F 35 3B 41 :54
9930 47 4D 53 59 5F 65 6B 71 :1C
9938 77 7D 83 89 8F 95 9B A1 :E4
9940 A7 AD B3 B9 BF C5 CB D1 :AC
9948 D7 DD E3 E9 EF F5 FB 01 :74
9950 07 0D 13 19 97 97 97 97 :64
9958 97 97 98 98 98 98 98 98 :B5
9960 98 98 98 98 98 98 98 98 :C0
9968 98 98 98 98 98 98 98 98 :C8
9970 98 98 98 98 98 98 98 98 :D0
9978 98 98 98 98 98 98 98 98 :D8
9980 98 98 98 98 99 99 99 99 :FA
9988 99 4E 4F 52 54 48 20 00 :26
9990 45 41 53 54 20 00 53 4F :FD
9998 55 54 48 20 00 57 45 53 :72
99A0 54 20 00 55 50 20 00 44 :F8
99A8 4F 57 4E 20 00 1E 59 4F :AA
99B0 55 20 4D 41 59 20 47 4F :16
99B8 20 54 4F 20 54 48 45 20 :24
99C0 0D 00 9B 59 4F 55 20 43 :83
99C8 41 4E 27 54 20 47 4F 20 :DD
99D0 54 48 41 54 20 57 41 59 :00
99D8 0D 00 20 20 20 20 20 20 :05
99E0 20 20 20 20 20 20 20 20 :60
99E8 20 20 20 20 20 20 20 0D :D0
99F0 00 9F 59 4F 55 20 41 52 :35
99F8 45 20 00 96 59 4F 55 20 :BF
9A00 41 52 45 20 43 41 52 52 :D7
9A08 59 49 4E 47 20 0D 00 4E :57
9A10 4F 54 48 49 4E 47 00 9E :23
9A18 49 20 43 41 4E 20 41 4C :DB
9A20 53 4F 20 53 45 45 0D 00 :0F
9A28 9B 59 4F 55 20 4D 41 4B :43
9A30 45 20 54 41 4B 45 0D 00 :25
9A38 9B 59 4F 55 20 4D 41 59 :C3
9A40 20 4C 45 41 56 45 0D 00 :72
9A48 A0 09 A2 17 18 20 F0 FF :FC
9A50 A9 C2 A0 99 20 1E AB 20 :C2
9A58 6A 9A A0 09 A2 17 18 20 :56
9A60 F0 FF A9 DA A0 99 20 1E :37
9A68 AB 60 A5 00 8D E6 03 A9 :44
9A70 04 8D E7 03 20 B3 EE CE :13
9A78 E6 03 AD E6 03 D0 F5 CE :15
9A80 E7 03 AD E7 03 D0 ED 60 :7A
9A88 A9 11 20 D2 FF A0 00 B9 :7E
9A90 9B 9B CD 3E 03 F0 08 C8 :E7
9A98 C0 0A D0 F3 4C B0 9A B9 :42
9AA0 91 9B F0 0C B9 AF 9B AA :AB
9AA8 B9 B9 9B A8 8A 20 1E AB :E0
9AB0 B9 91 9B 8D 7A 03 B9 9B :EB
9AB8 9B 8D 7B 03 60 41 20 43 :48
9AC0 41 4E 44 4C 45 53 54 49 :78
9AC8 43 48 2D 00 41 20 42 55 :A3
9AD0 43 4B 45 54 2D 00 50 49 :21
9AD8 4E 43 45 52 53 2D 00 41 :78
9AE0 20 42 4F 4E 45 2D 00 41 :18
9AE8 20 4C 41 44 44 45 52 2D :08
9AF0 00 41 20 50 45 4E 4E 59 :29
9AF8 2D 00 41 20 42 41 47 20 :29
9B00 4F 46 20 47 4F 4C 44 2D :EE
9B08 00 41 20 52 49 4E 47 2D :CC
9B10 00 41 20 50 49 45 2D 00 :78
9B18 41 20 50 4C 41 4E 4B 2D :47
9B20 00 41 20 53 49 4C 56 45 :05
9B28 52 20 42 45 4C 4C 2D 00 :13
9B30 41 20 43 41 54 2D 00 41 :38
9B38 20 42 4F 54 54 4C 45 2D :D0
9B40 00 41 20 47 4C 4F 56 45 :16
9B48 2D 00 0E 09 08 07 09 08 :94
9B50 0E 07 06 08 0E 06 09 08 :87
9B58 BD CC D6 DF E7 F1 FA 09 :F2
9B60 11 18 21 30 37 41 9A 9A :63
9B68 9A 9A 9A 9A 9A 9B 9B 9B :25
9B70 9B 9B 9B 9B 15 27 0F FF :32
9B78 FF FF FF FF FF FF 01 27 :A2
9B80 09 0D 0E 15 27 0F FF FF :2F
9B88 FF FF FF FF FF 01 27 09 :D8
```

```
9B90 0D 01 01 01 01 01 01 01 :C0
9B98 01 01 01 12 16 08 07 1F :AD
9BA0 1D 24 26 1A 2F 12 16 08 :10
9BA8 07 1F 1D 24 26 1A 2F C3 :BF
9BB0 F4 4D AC 17 91 92 DE 34 :91
9BB8 61 9B 9B 9C 9C 9D 9D 9D :7D
9BC0 9D 9E 9E 4D 41 52 59 20 :47
9BC8 4D 41 52 59 20 51 55 49 :12
9BD0 54 45 20 43 4F 4E 54 52 :55
9BD8 41 52 59 0D 49 53 20 54 :DB
9BE0 45 4E 44 49 4E 47 20 54 :61
9BE8 48 45 20 47 41 52 44 45 :6B
9BF0 4E 0D 0D 00 4F 4C 44 20 :AE
9BF8 4D 4F 54 48 45 52 20 48 :64
9C00 55 42 42 41 52 44 20 49 :FD
9C08 53 20 48 45 52 45 0D 53 :B2
9C10 48 45 20 53 41 59 53 20 :2E
9C18 48 45 4C 4C 4F 20 41 4E :80
9C20 44 20 41 53 4B 53 0D 59 :3F
9C28 4F 55 20 49 46 20 59 4F :AA
9C30 55 20 48 41 56 45 20 41 :D5
9C38 4E 59 20 46 4F 4F 44 0D :59
9C40 46 4F 52 20 48 45 52 20 :DE
9C48 44 4F 47 0D 00 54 48 45 :4B
9C50 52 45 20 49 53 20 41 20 :D6
9C58 4C 41 44 59 20 4F 4E 20 :F2
9C60 41 20 57 48 49 54 45 0D :B6
9C68 48 4F 52 53 45 20 48 45 :C9
9C70 52 45 2E 20 53 48 45 20 :B8
9C78 41 53 4B 53 20 59 4F 55 :13
9C80 20 49 46 20 0D 48 41 56 :EC
9C88 45 20 46 4F 55 4E 44 20 :74
9C90 41 20 52 49 4E 47 20 4F :B3
9C98 4E 20 59 4F 55 0D 59 4F :4B
9CA0 55 52 20 54 52 41 56 45 :EB
9CA8 4C 53 0D 00 54 48 45 20 :F8
9CB0 44 55 4B 45 20 4F 46 20 :F7
9CB8 59 4F 52 4B 20 49 53 20 :6C
9CC0 48 45 52 45 0D 4F 4E 20 :D9
9CC8 48 49 53 20 42 49 47 20 :0C
9CD0 42 4C 41 43 4B 20 48 4F :20
9CD8 52 53 45 0D 48 45 20 41 :C1
9CE0 53 4B 53 20 59 4F 55 20 :2C
9CE8 49 4E 20 41 20 4C 4F 55 :6A
9CF0 44 0D 56 4F 49 43 45 20 :6E
9CF8 49 46 20 59 4F 55 20 48 :3A
9D00 41 56 45 20 53 45 45 4E :CC
9D08 0D 41 4E 59 20 53 4F 4C :00
9D10 44 49 45 52 53 0D 00 49 :32
9D18 20 43 41 4E 20 53 45 45 :56
9D20 20 41 20 4C 41 52 47 45 :9C
9D28 20 53 49 4F 45 0D 57 49 :52
9D30 54 48 20 57 49 4E 44 4F :65
9D38 57 53 20 41 4E 44 20 41 :9F
9D40 20 44 4F 4F 52 2E 0D 41 :22
9D48 20 4C 41 44 59 20 49 53 :E7
9D50 20 53 54 41 4E 44 49 4E :A3
9D58 47 20 41 54 20 54 48 45 :AA
9D60 0D 44 4F 4F 52 2E 20 53 :44
9D68 48 45 20 48 41 53 20 4C :31
9D70 4F 54 53 20 4F 46 0D 48 :AA
9D78 55 4E 47 52 59 20 43 48 :18
9D80 49 4C 44 52 45 4E 20 57 :3A
9D88 49 54 48 20 48 45 52 0D :7D
9D90 00 00 4A 41 43 4B 20 41 :6B
9D98 4E 44 20 4A 49 4C 4C 20 :3F
9DA0 41 52 45 20 53 49 54 54 :15
9DA8 49 4E 47 0D 42 59 20 54 :76
9DB0 48 45 20 50 41 54 48 20 :57
9DB8 43 52 59 49 4E 47 2E 20 :40
9DC0 54 48 45 59 20 0D 48 41 :C5
9DC8 56 45 20 4C 4F 53 54 20 :01
9DD0 54 48 45 49 52 20 42 55 :77
9DD8 43 48 45 54 0D 00 53 49 :9E
9DE0 4D 50 4C 45 20 53 49 4D :BE
9DE8 4F 4E 20 49 53 20 57 41 :1F
9DF0 4C 4B 49 4E 47 0D 44 4F :EA
9DF8 57 4E 20 54 48 45 20 52 :11
9E00 4F 41 44 2E 20 48 45 20 :88
9E08 41 53 4B 53 20 49 46 0D :C4
9E10 59 4F 55 20 43 41 4E 20 :7D
9E18 47 49 56 45 20 48 49 4D :BE
9E20 20 41 20 50 45 4E 4E 59 :79
9E28 0D 46 4F 52 20 41 20 50 :7C
9E30 49 45 0D 00 49 20 53 45 :C4
9E38 45 20 41 20 50 49 45 20 :29
9E40 4D 41 4E 2E 20 48 45 20 :E4
9E48 48 41 53 0D 50 49 45 53 :00
9E50 20 4F 46 20 4D 41 4E 59 :51
9E58 20 53 49 5A 45 53 2E 0D :56
9E60 00 41 20 4C 41 52 47 45 :BC
9E68 20 44 52 41 47 4F 4E 20 :69
9E70 42 4C 4F 43 4B 53 20 59 :54
9E78 4F 55 52 20 57 41 59 20 :8F
9E80 53 4F 55 54 48 2E 20 49 :64
9E88 54 48 41 53 20 41 20 54 :21
9E90 4F 4F 54 48 20 41 43 48 :D4
9E98 45 2E 0D 00 A9 00 8D 84 :A8
9EA0 03 A0 00 A2 12 18 20 F0 :B5
9EA8 FF A9 FB A0 99 20 1E.AB :51
9EB0 A9 00 AA A8 B9 74 9B F0 :09
9EB8 0D C8 CC 82 9B D0 F5 A9 :A3
9EC0 0F A0 9A 20 1E AB A0 00 :55
9EC8 B9 74 9B F0 09 C8 CC 82 :7B
9ED0 9B D0 F5 4C 04 9F B9 4A :47
9ED8 9B 18 6D 84 03 C9 27 B0 :50
9EE0 18 8D 84 03 B9 5B 9B AA :E4
9EE8 B9 66 9B 8C 85 03 A8 8A :01
9EF0 20 1E AB AC 85 03 4C CD :24
9EF8 9E A9 0D 20 D2 FF B9 4A :02
9F00 9B 4C E1 9E 60 40 1F 1D :6F
```

Adventure Aid Graphics

Allen Webb helps you smarten up the looks of your adventure programs.

Text adventures are all very well but it's nice to have illustrations to smarten up the appearance of your own programs and make them look more professional.

This is the second part of the program which we began last month (*Your Commodore,* August 1986) and it should enable you to churn out exciting and attractive adventures. It compliments the Adventure Aid program which originally appeared in our May 1986 issue.

Using the Editor

Listing 1 gives an editor for the design and saving of pictures. Before you use it, we must resort to some cunning. In order to give you maximum RAM, sprites 32 to 39 are used. Since these are located where the Basic program normally exists, we must raise the program in RAM. Here's how:

1) Reset the machine with SYS 64738.
2) Type in the line:

10 POKE 44,10: POKE 2560,0: RUN

then RUN it. Ignore any Syntax error messages.
3) Type in NEW and load the editor.
4) Input, in direct mode, POKE 44,8.
5) Save the program. If, after saving, you type in LIST, you should only see the line entered in step 2 above.

You can now use the editor safely. The editor has plenty of prompts to help you to use it. You may not fully appreciate PAINT mode. Any sprite comprises of dots over the background colour. Characters POKEd on to the screen will appear behind the sprite as

The following table gives a brief summary:

Main Menu	
I	invert picture
H	enter high resolution mode
M	enter multicolour mode
F	fill picture
X	toggle x expand
Y	toggle Y expand
£	change background colour
F1	change colour used in Paper mode
F3	change colour 1
F5	change colour 3
P	enter PAPER moder
Key 0 to 7	change sprite colours
E	enter EDIT mode
D	enter DATA movement mode
Q	quit
Edit Mode	
I	invert picture
Shift clear	clear picture
Home	draw cursor
E	Exit to main menu
+	draw point
–	erase point
P	change pen
	move cursor to bottom right
	move cursor to left end of current line
	move cursor to right end of current line
*	mark one end of line or apex of triangle
=	mark bottom left corner of triangle
L	draw line
B	draw block
T	triangle
/	change line type
Cursor keys	as usual

Paper Mode

Keys 1 to 5	change pattern
F1	toggle sprite on or off
F3	change paper colour
F5	toggle reverse field
E	exit to main menu

a changed background. It is therefore possible to create extra colours and textures using this option. Any backgrounds you design are not saved with the sprite and you must make your own program create it. The paint option gives you a number of textures with F5 offering a reverse field.

I don't really have space here to fully describe the functions of the editor but I'm sure you'll get the idea after a bit of dabbling.

Date Move Mode

Allows you to move pictures to and from RAM and mix designs. Contents of RAM may be saved or loaded from data storage.

Line, Block, Triangle

I don't intend to describe the editor at length since you can sort it out by using it. I shall, however, describe how the Line, Block and Triangle commands work:

Line: Place the cursor at one end of the line and press *. Move the cursor to the other end and press L. The end of the line will stay constant until * is pressed again allowing you to draw rays emanating from a single point.

Block: Exactly for line but you press B.

Triangle: Place the cursor at the apex and press *. Move the cursor to the bottom left corner and press =. Move the cursor horizontally to the bottom right corner and press T.

All three commands use the current line type.

The second editor allows you to set up a sequence of drawing instructions. The editor enters your commands into a temporary buffer with error detection to prevent out of range values. The temporary buffer only holds one command and is provided to allow you to test the effect of a command on the sequence. A second buffer is used to store the sequence. This can also be tested.

The command to test the temporary buffer will display the current picture and execute the command in the buffer. The sequence test command runs the full sequence. If you are happy with the command in the temporary buffer, you can then tack it on to the end of the sequence.

I've kept the editor simple with no commands to save or load sequences – I leave that to you. There is a simple command to display the sequence on the screen and it would be simple to convert it to use a printer.

This editor must also be relocated using the technique described earlier, in the first part of this series.

Try the editors and alter them as you see fit, I'm sure you'll agree that the results possible are quite decent.

PROGRAM: EDITOR

```
Please read 'LISTINGS'
before entering program.

AF  10 REM***********************
    ***
71  20 REM* SPRITE PICTURE EDITO
    R *
0C  30 REM*      A + M 1986
      *
E1  40 REM***********************
    ***
30  50 DEF FNA(PX)=1064+PY*40+PX
    +1: POKE53280,14
3A  60 SA=30720:GOSUB 2070
25  70 OX=32: OY=58: PRINTCHR$(1
    4)
EC  80 TY=1: XW=1: YW=1: PA=12:D
    X=0:DY=0:CC=1:LI=1:REM DEFAU
    LT SETTINGS
1A  90 PRINTCHR$(147): POKE53281
    ,0: GOSUB 1660: POKE 650,128

C1  100 SYS SA+42,2040,32: REM
    SET WINDOW LOCATION
B9  110 SYS SA,OX,OY,SC(1),TY,XW
    ,YW: REM CLEAR & DISPLAY SPR
    ITES
98  115 SYS SA+3,SC(0),SC(1),SC(
    2),SC(3),SC(4),SC(5),SC(6),S
    C(7)
53  120 SYS SA+6,C1,C2,C3
BF  130 GETI$:IFI$=""THEN130
4C  140 IF I$<"0"ORI$>"8"THEN 17
    0
26  150 SC(VAL(I$))=SC(VAL(I$))+
    1:POKE 55896+VAL(I$)*2,SC(VA
    L(I$))
6A  160 SYS SA+3,SC(0),SC(1),SC(
    2),SC(3),SC(4),SC(5),SC(6),S
    C(7):GOTO130
90  170 IFI$="I"THEN SYS SA+21:G
    OTO130
BA  180 IF I$="M" THEN TY=1: POK
    E 53276,255: POKE 1808,77: P
    OKE 56080,7:  GOTO130
3B  190 IF I$="H" THEN TY=0: POK
    E 53276,0: POKE 1808,72:POKE
     56080,7: GOTO 130
A6  200 IF I$="F" THEN 1400
50  210 IF I$="X" AND XW=0 THEN
    XW=1: GOSUB1630: GOTO160
98  220 IF I$="X" AND XW=1 THEN
    XW=0: GOSUB1630: GOTO160
A5  230 IF I$="Y" AND YW=0 THEN
    YW=1: GOSUB1630: GOTO160
BF  240 IF I$="Y" AND YW=1 THEN
    YW=0: GOSUB1630: GOTO160
5D  250 IF I$="[F1]"THENPA=PA+1:
    POKE 55982,PA:GOTO130
DA  260 IF I$="[F3]"THENC1=(C1+1
    )AND15:SYS SA+6,C1,C2,C3:POK
    E 55990,C1:GOTO130
1E  270 IF I$="[F5]"THENC2=(C2+1
    )AND15:SYS SA+6,C1,C2,C3:POK
    E 55998,C2:GOTO130
```

```
D1  280 IF I$="P"THEN380
00  290 IF I$="E"THEN POKE53280,
    10:GOSUB1820: GOSUB1490:GOTO
     700
1B  300 IF I$="D"THEN POKE53280,
    13:GOTO 920
5C  310 IF I$="Q" THEN SYS SA+15
    :PRINTCHR$(147):END
40  320 IF I$="[DOWN]" THEN OY=O
    Y+1:GOTO1630:GOTO130
27  330 IF I$="[UP]" THEN OY=OY-
    1:GOTO1630:GOTO130
B0  340 IF I$="[RIGHT]" THEN OX=
    OX+1:GOTO1630:GOTO130
6F  350 IF I$="[LEFT]" THEN OX=O
    X-1:GOTO1630:GOTO130
97  360 IFI$="0008HμIIB"THEN C3=C
    S SA+6,C1,C2,C3:GOTO130
48  370 GOTO130
A6  380 GOSUB1820:PRINTCHR$(19)T
    AB(26)"[WHITE,RVSON,SP]APER
    [SM]ODE[RVSOFF,WHITE,DOWN]"
61  390 PRINTTAB(26)"[WHITE,RVSO
    N]1[RVSOFF] : [YELLOW,RVSON]
    SPACE[RVSOFF,WHITE]"
47  400 PRINTTAB(26)"[RVSON]2[RV
    SOFF] : [YELLOW,C+,WHITE]"
57  410 PRINTTAB(26)"[RVSON]3[RV
    SOFF] : [YELLOW,CB,WHITE]"
8A  420 PRINTTAB(26)"[RVSON]4[RV
    SOFF] : [YELLOW,S0008HμIIB,WHI
E1  430 PRINTTAB(26)"[RVSON]5[RV
    SOFF] : [YELLOW,C*,WHITE]"
6E  440 PRINTTAB(26)"[RVSON]6[RV
    SOFF] : [YELLOW,S+,WHITE]"
7E  450 PRINTTAB(26)"[RVSON,SF]1
    [RVSOFF]: [YELLOW]TOGGLE[WHI
    TE]"
48  460 PRINTTAB(26)"[RVSON,SF]3
    [RVSOFF]: [YELLOW]PAPER[WHIT
    E]"
2A  470 PRINTTAB(26)"[RVSON,SF]5
    [RVSOFF]: [YELLOW]REVERSE[WH
    ITE]"
A2  480 PRINTTAB(26)"[RVSON,SE,R
    VSOFF] : [YELLOW]EXIT[WHITE]
    "
38  490 PX=0:PY=0:CH=32
67  500 POKE FNA(PX),CH+ABS((RF=
    1)*128): POKE FNA(PX)+54272,
    PA
BB  510 GET I$:IFI$=""THEN580
CB  520 IF I$="1" THEN CH=32: GO
    TO510
22  530 IF I$="2" THEN CH=102:GO
    TO510
6E  540 IF I$="3" THEN CH=127:GO
    TO510
D3  550 IF I$="4" THEN CH=105: G
    OTO510
A0  560 IF I$="5" THEN CH=95: GO
    TO510
ED  570 IF I$="6" THEN CH=91: GO
    TO510
36  580 IF I$="[F1]" AND PEEK(53
    269)=0 THEN POKE53269,255: G
    OTO510
81  590 IF I$="[F5]" AND RF=0 TH
    EN RF=1:GOTO510
00  600 IF I$="[F5]" AND RF=1 TH
    EN RF=0:CH=CH+(CH>128)*128:G
    OTO510
08  610 IF I$="[F1]" AND PEEK(53
    269)=255 THEN POKE53269,0:GO
    TO510
CC  620 IF I$="[F3]"THEN PA=PA+1
    :POKE55982,PA:GOTO510
86  630 IF I$="[RIGHT]"AND PX<23
     THEN PX=PX+1:GOTO500
46  640 IF I$="[LEFT]"AND PX>0
    THEN PX=PX-1:GOTO500
25  650 IF I$="[DOWN]"AND PY<10
    THEN PY=PY+1:GOTO500
35  660 IF I$="[UP]"AND PY>0  TH
    EN PY=PY-1:GOTO500
07  670 IF I$<>"E"THEN500
09  680 GOSUB 1820:GOSUB1830
61  690 POKE53280,14:GOTO130
DB  700 GET I$:IFI$=""THEN SYS S
    A+12,DX,DY,2:SYS SA+12,DX,DY
    ,2:GOTO700
B5  710 IF I$="[HOME]" THEN DX=0
    :DY=0: GOTO 700
6E  720 IF I$="[CLR]" THEN SYS S
    A+9,0:DX=0:DY=0:GOTO 700
BF  730 IF I$="@" THEN DX=94:DY=
    42: GOTO 700
18  740 IF I$="[RIGHT]" AND DX<9
    4 AND TY=1 THENDX=DX+2:GOTO7
    00
3C  750 IF I$="[RIGHT]" AND DX<9
    6 AND TY=0 THENDX=DX+1:GOTO7
    00
5A  760 IF I$="[LEFT]" AND DX>0
    AND TY=0THENDX=DX-1:GOTO700
CE  770 IF I$="[LEFT]" AND DX>1
    AND TY=1THENDX=DX-2:GOTO700
FD  780 IF I$="[DOWN]" AND DY<42
     THENDY=DY+1:GOTO700
B7  781 IF I$=">"AND TY=0THEN DX
    =95:GOTO700
24  782 IF I$=">"AND TY=1THEN DX
    =94:GOTO700
D0  790 IF I$="[UP]" AND DY>0 TH
```

```
     ENDY=DY-1:GOTO700
91   791 IF I$="<"THEN DX=0:GOTO7
     00
C2   792 IF I$="*"THEN LX=DX: LY=
     DY:GOTO700
70   793 IF I$="L"ANDTY=0 THEN SY
     S SA+24,LX,LY,DX,DY,LI:GOTO7
     00
42   794 IF I$="L"ANDTY=1 THEN SY
     S SA+27,LX/2,LY,DX/2,DY,CC:G
     OTO700
D0   795 IF I$="B"ANDTY=0 THEN SY
     S SA+51,LX,LY,DX,DY,LI:GOTO7
     00
74   796 IF I$="B"ANDTY=1 THEN SY
     S SA+54,LX/2,LY,DX/2,DY,CC:G
     OTO700
69   797 IF I$="T"ANDTY=0 THEN SY
     S SA+57,LX,LY,XX,YY,DX,LI:GO
     TO700
D3   798 IF I$="T"ANDTY=1 THEN SY
     S SA+60,LX/2,LY,XX/2,YY,DX/2
     ,CC:GOTO700
21   799 IF I$="="THEN XX=DX: YY=
     DY:GOTO700
C4   800 IF I$="+"AND TY=0THEN SY
     S SA+12,DX,DY,1:GOTO890
29   810 IF I$="+"AND TY=1THEN SY
     S SA+18,DX/2,DY,CC:GOTO890
F7   820 IF I$="-"AND TY=0THEN SY
     S SA+12,DX,DY,0:GOTO890
03   830 IF I$="-"AND TY=1THEN SY
     S SA+18,DX/2,DY,0 :GOTO890
61   840 IF I$="E"THEN POKE53280,
     14:GOSUB 1820:GOSUB1830:GOTO
     130
5E   850 IF I$="I"THEN SYSSA+21:G
     OTO700
22   851 IFI$<>"/"THEN860
29   852 LI=LI+1: IFLI=3 THEN LI=
     4
66   853 IF LI=6 THENLI=0
9D   854 CY=20:CX=19:GOSUB2020:PR
     INTLI:GOTO700
CD   860 IF I$<>"P"THEN700
44   870 CC=CC+1:IFCC=4 THEN CC=0

69   880 CY=12:CX=19:GOSUB2020:PR
     INTCC:GOTO700
7E   890 IF TY=0 AND DX <96 THEN
     DX=DX+1:GOTO700
0C   900 IF TY=1 AND DX <96 THEN
     DX=DX+2:GOTO700
AF   910 GOTO700
AC   920 CY=0:CX=21:GOSUB2020
96   930 PRINT"[RVSON,SR,RVSOFF]A
     M OR [RVSON,SS,RVSOFF]TORAGE
     "
72   940 INPUT MO$
1B   950 IF MO$="S"THEN 1220
4A   960 NL=2:GOSUB2030:CY=0:CX=2
     1:GOSUB2020
EA   970 PRINT"[RVSON,SS,RVSOFF]A
     VE, [RVSON,SL,RVSOFF]OAD OR
     [RVSON,SM,RVSOFF]IX"
AA   980 INPUT MO$
61   990 IF MO$="S"THEN1020
5A   1000 IF MO$="L"THEN1060
EE   1010 IF MO$="M"THEN1100
66   1020 NL=2:GOSUB2030:CY=0:CX=
     21:GOSUB2020
D3   1030 PRINT"START ADDRESS"
34   1040 INPUT AD
34   1050 SYS SA+30,AD:GOTO1200
C9   1060 NL=2:GOSUB2030:CY=0:CX=
     21:GOSUB2020
6B   1070 PRINT"START ADDRESS"
DC   1080 INPUT AD
4B   1090 SYS SA+33,AD:GOSUB2070
ED   1095 FOR I=0TO7: POKE 55896+
     I*2,SC(I):NEXT
69   1096 POKE 55990,C1:POKE55998
     ,C2:GOTO1200
41   1100 NL=2:GOSUB2030:CY=0:CX=
     21:GOSUB2020
63   1110 PRINT"START ADDRESS"
84   1120 INPUT AD
5F   1130 NL=2:GOSUB2030:CY=0:CX=
     21:GOSUB2020
EF   1140 PRINT"MIXING RULE [RVSO
     N,SA,RVSOFF]ND/[RVSON,SO,RVS
     OFF]R/[RVSON,SE,RVSOFF]OR"
EE   1150 INPUT RU$
51   1160 IF RU$="A"THEN RU=0
64   1170 IF RU$="O"THEN RU=1
73   1180 IF RU$="E"THEN RU=2
85   1190 SYS SA+36,AD,RU
28   1200 NL=2:GOSUB2030
C9   1210 POKE 53280,14:GOTO130
E9   1220 NL=2:GOSUB2030:CY=0:CX=
     21:GOSUB2020
DB   1230 PRINT"[RVSON,SS,RVSOFF]
     AVE OR [RVSON,SL,RVSOFF]OAD"

A2   1240 INPUT OP$
E7   1250 NL=2:GOSUB2030:CY=0:CX=
     21:GOSUB2020
FE   1260 PRINT"FILE NAME"
06   1270 INPUT FI$
94   1280 NL=2:GOSUB2030:CY=0:CX=
     21:GOSUB2020
4A   1290 PRINT"DEVICE"
3D   1300 INPUT DE
31   1310 IF OP$="L"THEN POKE 532
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```
     69,0:LOAT FI$,DE,1: POKE5326
     9,255:GOTO130
4C   1320 NL=2:GOSUB2030:CY=0:CX=
     21:GOSUB2020
78   1330 PRINT"START ADDRESS"
F8   1340 INPUT SA
62   1350 NL=2:GOSUB2030:CY=0:CX=
     21:GOSUB2020
77   1360 PRINT"END ADDRESS"
00   1370 INPUT EA
07   1380 POKE 53269,0:SYS 49191
     FI$,DE,2,SA,EA:POKE53269,255
     :RUN
61   1390 GOTO1390
72   1400 CY=0:CX=21:GOSUB2020
8D   1410 PRINT"[SB,SY,ST,SE] [SV
     ,SA,SL,SU,SE] (0 TO ERASE)"
CF   1420 INPUT BY
E5   1430 SYS SA+9,BY
AA   1440 CY=0:CX=21:GOSUB2020
DA   1450 PRINT"[SPC27]"
C4   1460 PRINT"[SPC27]"
78   1470 GOTO130
4D   1480 END
26   1490 PRINTCHR$(19)TAB(26)"[R
     VSON,WHITE,SD]RAW [SM]ODE[WH
     ITE,DOWN]"
34   1500 PRINTTAB(26)"[RVSON,SI,
     RVSOFF]:[YELLOW,SI]NVERT[WHI
     TE]"
B1   1510 PRINTTAB(26)"[RVSON,SS,
     SH]-[SH,SO,SM,SE,RVSOFF]:[YE
     LLOW]CLEAR[WHITE]"
BD   1520 PRINTTAB(26)"[RVSON,SH,
     SO,SM,SE,RVSOFF]:[YELLOW]HOM
     E  [WHITE]"
CC   1530 PRINTTAB(26)"[RVSON,SE,
     RVSOFF]:[YELLOW,SE]XIT[WHITE
     ]"
5E   1540 PRINTTAB(26)"[RVSON]+[R
     VSOFF]:[YELLOW]SET DOT[WHITE
     ]"
87   1550 PRINTTAB(26)"[RVSON]-[R
     VSOFF]:[YELLOW]CLEAR DOT[WHI
     TE]"
92   1560 PRINTTAB(26)"[RVSON,SP,
     RVSOFF]:[YELLOW]CHANGE INK[W
     HITE]"
68   1568 PRINTTAB(26)"[RVSON]@[R
     VSOFF]:[YELLOW]DOT BLC[WHITE
     ]"
75   1569 PRINTTAB(26)"[RVSON]<[R
     VSOFF]:[YELLOW]DOT LEFT[WHIT
     E]"
8F   1570 PRINTTAB(26)"[RVSON]>[R
     VSOFF]:[YELLOW]DOT RIGHT[WHI
     TE]"
A4   1571 PRINTTAB(26)"[RVSON]*[R
     VSOFF]:[YELLOW]MRK POINT 1[W
     HITE]"
E7   1572 PRINTTAB(26)"[RVSON]=[R
     VSOFF]:[YELLOW]MRK POINT 2[W
     HITE]"
FD   1573 PRINTTAB(26)"[RVSON,SL,
     RVSOFF]:[YELLOW]DRAW LINE[WH
     ITE]"
91   1574 PRINTTAB(26)"[RVSON,SB,
     RVSOFF]:[YELLOW]DRAW BLOCK[W
     HITE]"
8C   1575 PRINTTAB(26)"[RVSON]/[R
     VSOFF]:[YELLOW]LINE TYPE[WHI
     TE]"
3C   1576 PRINTTAB(26)"[RVSON,ST,
     RVSOFF]:[YELLOW,ST]RIANGLE[W
     HITE]"
82   1600 PRINTTAB(26)"[WHITE]CUR
     SOR KEYS"
BD   1610 PRINTTAB(26)"TO MOVE DO
     T[WHITE]"
D4   1620 RETURN
45   1630 SYS SA,OX,OY,SC(1),TY,X
     W,YW: GOTO160
21   1640 SYS SA+3,SC(0),SC(1),SC
     (2),SC(3),SC(4),SC(5),SC(6),
     SC(7)
F6   1650 RETURN
A4   1660 PRINTCHR$(19)"[CYAN,CA,
     S*24,CS]"
2B   1670 FOR I=1TO11
A7   1680 PRINT"[S-,SPC24,S-]":NE
     XT
8B   1690 PRINT"[CZ,S*24,CW]"
83   1700 FOR I=1TO7:PRINTTAB(25)
     "[S-]":NEXT
4A   1710 CY=0:CX=13:GOSUB2020
93   1720 PRINT"[WHITE,SS]PRITE [
     SC]OLOURS [[SP]EN 2]
75   1730 PRINT"0 1 2 3 4 5 6 7"
40   1740 PRINT"[RVSON] [RIGHT] [
     RIGHT] [RIGHT] [RIGHT] [RIGH
     T] [RIGHT] [RIGHT] "
EC   1750 FOR I=0TO7: POKE 55896+
     I*2,SC(I):NEXT
34   1760 PRINT"[DOWN,SP]APER:[RV
     SON] [RVSOFF] [SP]EN 1:[RVSO
     N] [RVSOFF] [SP]EN 3:[RVSON]
      [RVSOFF]"
F4   1770 POKE 55982,PA:POKE 5599
     0,C1:POKE 55998,C2
04   1780 PRINT"[DOWN,SC]URRENT [
     SP]EN:"CC
51   1781 PRINT"[UP,RIGHT15]LINE:
     "LI
1F   1782 POKE 53276,255: POKE 18
```

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     08,77: POKE 56080,7
F3   1790 PRINT"[CYAN,S*25,CE,S*1
     0]"
28   1800 GOSUB 1830
97   1810 RETURN
B3   1820 PRINT"[HOME]";:FORI=0TO
     19:PRINTTAB(26)"[SPC13]":NEX
     T:RETURN
9F   1830 PRINTCHR$(19)TAB(26)"[W
     HITE,RVSON,SM]AIN [SM]ENU[WH
     ITE,DOWN]"
BB   1840 PRINTTAB(26)"[WHITE,RVS
     ON,SI,RVSOFF] :[YELLOW]INVER
     T[WHITE]"
17   1850 PRINTTAB(26)"[RVSON,SH,
     RVSOFF] :[YELLOW]HIGH RES[WH
     ITE]"
C7   1860 PRINTTAB(26)"[RVSON,SM,
     RVSOFF] :[YELLOW]MULTI COL[W
     HITE]"
72   1870 PRINTTAB(26)"[RVSON,SF,
     RVSOFF] :[YELLOW]FILL[WHITE]
     "
1D   1880 PRINTTAB(26)"[RVSON,SX,
     RVSOFF] :[YELLOW]EXPAND X[WH
     ITE]"
07   1890 PRINTTAB(26)"[RVSON,SY,
     RVSOFF] :[YELLOW]EXPAND Y[WH
     ITE]"
CD   1900 PRINTTAB(26)"[RVSON]000[illegible]
     VSOFF] :[YELLOW]BACKGROUND[W
     HITE]"
1F   1910 PRINTTAB(26)"[YELLOW,SP
     C3]COLOUR[WHITE]"
78   1920 PRINTTAB(26)"[RVSON,SF]
     1[RVSOFF]:[YELLOW]PAPER[WHIT
     E]"
8F   1930 PRINTTAB(26)"[RVSON,SF]
     3[RVSOFF]:[YELLOW]COLOUR 1[W
     HITE]"
A5   1940 PRINTTAB(26)"[RVSON,SF]
     5[RVSOFF]:[YELLOW]COLOUR 3[W
     HITE]"
C2   1950 PRINTTAB(26)"[RVSON,SP,
     RVSOFF] :[YELLOW]PAPER MODE[
     WHITE]"
7D   1960 PRINTTAB(26)"[RVSON,SE,
     RVSOFF] :[YELLOW]EDIT MODE[W
     HITE]"
B0   1970 PRINTTAB(26)"[RVSON,SD,
     RVSOFF] :[YELLOW]DATA MODE[W
     HITE]"
E9   1980 PRINTTAB(26)"[RVSON,SQ,
     RVSOFF] :[YELLOW]QUIT[WHITE]
     "
F4   1990 PRINTTAB(26)"[DOWN,WHIT
     E]CURSOR KEYS"
9D   2000 PRINTTAB(26)"MOVE PICTU
     RE"
6F   2010 RETURN
64   2020 POKE 782,CY:POKE781,CX:
     POKE783,0:SYS65520:RETURN
DA   2030 CY=0:CX=21:GOSUB2020
5F   2040 FOR I=0TONL
53   2050 PRINT"[SPC38]":NEXT
9A   2060 RETURN
DA   2070 C1=PEEK(900): C2=PEEK(9
     01)
B5   2080 FOR I=0TO7: SC(I)=PEEK(
     902+I)AND15:NEXT
BC   2090 RETURN
```

PROGRAM: SEQ.EDITOR

Please read 'LISTINGS' before entering program.

```
AF   10 REM*******************
5B   20 REM* SEQUENCE EDITOR *
A6   30 REM*   A + M  1986   *
05   40 REM*******************
81   50 TA=49152: FA=50000: SA=30
     720: SYS SA+42,2040,32
85   60 PRINTCHR$(147)"[RVSON,WHI
     TE]W[RVSOFF]ARM START OR [RV
     SON]C[RVSOFF]OLD START";:INP
     UT I$:
84   70 IF I$="W"THENCC=PEEK(999)
     :GOTO90
70   80 GOSUB 270: CC=0: POKE TA,
     255: POKE 999,CC
E0   90 POKE 53280,0: POKE53281,0
     : POKE646,15
EE   100 PRINTCHR$(147)TAB(6)"[YE
     LLOW]GRAPHICS SEQUENCE GENER
     ATOR"
2E   110 PRINTTAB(6)"[CT27]"
B4   120 PRINT "[DOWN2]"TAB(10)"[
     WHITE]1. [CYAN]ERASE SEQUENC
     E"
4F   130 PRINT TAB(10)"[WHITE]2.
     [CYAN]ENTER COMMAND  "
22   140 PRINT TAB(10)"[WHITE]3.
     [CYAN]TEST COMMAND  "
3D   150 PRINT TAB(10)"[WHITE]4.
     [CYAN]ADD TO SEQUENCE"
78   160 PRINT TAB(10)"[WHITE]5.
     [CYAN]TEST SEQUENCE"
```

```
7E  165 PRINT TAB(10)"[WHITE]6.
    [CYAN]DISPLAY SEQUENCE"
C2  170 PRINT"[DOWN3,C5]  [CA,S*
    35,CS]
55  180 C$=STR$(CC): C$=RIGHT$(C
    $,LEN(C$)-1)
5B  190 IF LEN(C$)<3THENC$="0"+C
    $
11  200 IFLEN(C$)<3THEN190
36  210 PRINT"[YELLOW]  [C5,S-]
    [YELLOW]BYTES USED:[GREEN]"C
    $"[SPC20,C5,S-]"
2E  220 PRINT"  [C5,S-] [YELLOW]
    SEQUENCE OCCUPIES:[GREEN]"FA
    "TO"FA+CC"[C5,S-]"
23  230 PRINT"[C5]  [CZ,S*35,CX]

2D  240 GET I$: IFI$<"1"ORI$>"6"
    THEN240
D2  250 ON VAL(I$) GOSUB 270,400
    ,280,320,360,1700
FD  260 GOTO 100
02  270 FOR I=0TO255: POKE FA+I,
    255:NEXT:CC=0:POKE999,0:RETU
    RN
E2  280 PRINTCHR$(147):POKE 5326
    9,255:SYS SA+63,TA
41  290 GET I$:IFI$=""THEN290
A9  300 SYS SA+15
B9  310 RETURN
52  320 IF CC+PN>255 THEN PRINT"
    SORRY NO MORE ROOM IN THIS S
    EQUENCE":GOTO 370
84  330 POKE 53280,11
E5  340 FOR I=0TOPN: POKE FA+CC+
    I,PEEK(TA+I):NEXT:CC=CC+PN:P
    OKE999,CC
6E  350 POKE 53280,0:RETURN
20  360 PRINTCHR$(147):SYS SA+63
    ,FA
10  370 GET I$:IFI$=""THEN370
59  380 SYS SA+15
09  390 RETURN
62  400 PRINTCHR$(147)"[DOWN3]"T
    AB(10)"[WHITE]1. [CYAN]PICTU
    RE SETUP"
8D  410 PRINTTAB(10)"[WHITE]2. [
    CYAN]SPRITE COLOURS"
B8  420 PRINTTAB(10)"[WHITE]3. [
    CYAN]COLOUR REGISTERS"
22  430 PRINTTAB(10)"[WHITE]4. [
    CYAN]FILL PICTURE"
AD  440 PRINTTAB(10)"[WHITE]5. [
    CYAN]DRAW DOT (HIRES)
D8  450 PRINTTAB(10)"[WHITE]6. [
    CYAN]DRAW DOT (MULTICOL)
80  460 PRINTTAB(10)"[WHITE]7. [
    CYAN]LINE (HIRES)
13  470 PRINTTAB(10)"[WHITE]8. [
    CYAN]LINE (MULTICOLOUR)
37  480 PRINTTAB(10)"[WHITE]9. [
    CYAN]SQUARE (HIRES)
43  490 PRINTTAB(10)"[WHITE]10.
    [CYAN]SQUARE (MULTICOLOUR)
27  500 PRINTTAB(10)"[WHITE]11.
    [CYAN]TRIANGLE (HIRES)
FA  510 PRINTTAB(10)"[WHITE]12.
    [CYAN]TRIANGLE (MULTICOLOUR)

32  520 PRINTTAB(10)"[WHITE]13.
    [CYAN]BRUSH (HIRES)
55  530 PRINTTAB(10)"[WHITE]14.
    [CYAN]BRUSH (MULTICOLOUR)
FB  540 PRINT"[HOME,DOWN17]"TAB(
    18);:INPUTI
F8  550 IF I>9 THEN 580
54  560 ON I GOSUB 600,680,740,7
    90,820,900,990,1060,1140
B2  570 RETURN
FF  580 ON I-9 GOSUB 1210,1290,1
    370,1460,1560
DE  590 RETURN
DF  600 PRINTCHR$(147):INPUT "[W
    HITE]X COORDINATE";P(1): P(0
    )=0
5C  610 INPUT "Y COORDINATE";P(2
    )
34  620 INPUT "COLOUR";P(3)
34  630 INPUT "TYPE 0=HIRES, 1=M
    ULTICOLOUR";P(4)
6E  640 INPUT "X EXPAND? 0=NO, 1
    =YES";P(5)
24  650 INPUT "Y EXPAND? 0=NO, 1
    =YES";P(6)
AE  660 FOR PN=0TO6: POKE TA+PN,
    P(PN):NEXT: POKE TA+PN,255
2E  670 RETURN
47  680 PRINTCHR$(147)
9B  690 FOR I=1TO8
5E  700 PRINT"INPUT COLOUR FOR S
    PRITE"I;:INPUT P(I):NEXT
DC  710 P(0)=1
10  720 FOR PN=0TO8: POKE TA+PN,
    P(PN):NEXT: POKE TA+PN,255
52  730 RETURN
FC  740 PRINTCHR$(147): INPUT"CO
    LOUR REGISTER 1";P(1): P(0)=
    2
BE  750 INPUT"COLOUR REGISTER 2"
    ;P(2)
EA  760 INPUT"BACKGROUND COLOUR"
    ;P(3)
E8  770 FOR PN=0TO3: POKE TA+PN,
    P(PN):NEXT: POKE TA+PN,255
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```
81  780 RETURN
5D  790 PRINTCHR$(147): INPUT"BY
    TE VALUE";P(1): P(0)=3
48  800 FOR PN=0TO1: POKE TA+PN,
    P(PN):NEXT: POKE TA+PN,255
A3  810 RETURN
03  820 PRINTCHR$(147): INPUT"X
    COORDINATE";P(1): P(0)=4
73  830 INPUT"Y COORDINATE";P(2)

11  840 INPUT"FLAG";P(3)
D4  850 IF P(1)>95 THEN P(1)=95
60  860 IF P(2)>41 THEN P(2)=41
62  870 IF P(3)>2 THEN P(3)=2
4E  880 FOR PN=0TO3: POKE TA+PN,
    P(PN):NEXT: POKE TA+PN,255
F3  890 RETURN
B2  900 PRINTCHR$(147): INPUT"X
    COORDINATE";P(1): P(0)=5
43  910 INPUT"Y COORDINATE";P(2)

98  920 INPUT"PEN";P(3)
E4  930 IF P(1)>95 THEN P(1)=95
70  940 IF P(2)>41 THEN P(2)=41
81  950 IF P(3)>3 THEN P(3)=2
A5  960 P(1)=P(1)AND 254
60  970 FOR PN=0TO3: POKE TA+PN,
    P(PN):NEXT: POKE TA+PN,255
59  980 RETURN
21  990 PRINTCHR$(147): INPUT"X1
     COORDINATE";P(1): P(0)=6:IF
    P(1)>95THENP(1)=95
B7  1000 INPUT"Y1 COORDINATE";P(
    2): IFP(2)>41THENP(2)=41
F6  1010 INPUT"X2 COORDINATE";P(
    3): IF P(3)>95THENP(3)=95
26  1020 INPUT"Y2 COORDINATE";P(
    4): IF P(4)>41THENP(4)=41
91  1030 INPUT"FLAG";P(5): IFP(5
    )>5 THENP(5)=5
13  1040 FOR PN=0TO5: POKE TA+PN
    ,P(PN):NEXT: POKE TA+PN,255
90  1050 RETURN
15  1060 PRINTCHR$(147): INPUT"X
    1 COORDINATE";P(1): P(0)=7:I
    FP(1)>95THENP(1)=95
D4  1070 INPUT"Y1 COORDINATE";P(
    2): IFP(2)>41THENP(2)=41
1D  1080 INPUT"X2 COORDINATE";P(
    3): IF P(3)>95THENP(3)=95
97  1090 INPUT"Y2 COORDINATE";P(
    4): IF P(4)>41THENP(4)=41
B0  1100 INPUT"PEN";P(5): IFP(5)
    >3 THENP(5)=3
0A  1110 P(1)=P(1)AND254: P(3)=P
    (3)AND254
43  1120 FOR PN=0TO5: POKE TA+PN
    ,P(PN):NEXT: POKE TA+PN,255
E0  1130 RETURN
00  1140 PRINTCHR$(147): INPUT"X
    1 COORDINATE";P(1): P(0)=8:I
    FP(1)>95THENP(1)=95
04  1150 INPUT"Y1 COORDINATE";P(
    2): IFP(2)>41THENP(2)=41
0D  1160 INPUT"X2 COORDINATE";P(
    3): IF P(3)>95THENP(3)=95
C7  1170 INPUT"Y2 COORDINATE";P(
    4): IF P(4)>41THENP(4)=41
E3  1180 INPUT"FLAG";P(5): IFP(5
    )>5 THENP(5)=5
81  1190 FOR PN=0TO5: POKE TA+PN
    ,P(PN):NEXT: POKE TA+PN,255
3A  1200 RETURN
71  1210 PRINTCHR$(147): INPUT"X
    1 COORDINATE";P(1): P(0)=9:I
    FP(1)>95THENP(1)=95
D2  1220 INPUT"Y1 COORDINATE";P(
    2): IFP(2)>41THENP(2)=41
1B  1230 INPUT"X2 COORDINATE";P(
    3): IF P(3)>95THENP(3)=95
35  1240 INPUT"Y2 COORDINATE";P(
    4): IF P(4)>41THENP(4)=41
E2  1250 INPUT"PEN";P(5): IFP(5)
    >3 THENP(5)=3
B0  1260 P(1)=P(1)AND254: P(3)=P
    (3)AND254
F1  1270 FOR PN=0TO5: POKE TA+PN
    ,P(PN):NEXT: POKE TA+PN,255
8B  1280 RETURN
44  1290 PRINTCHR$(147): INPUT"X
    1 COORDINATE";P(1): P(0)=10:
    IFP(1)>95THENP(1)=95
8D  1300 INPUT"Y1 COORDINATE";P(
    2): IFP(2)>41THENP(2)=41
0C  1310 INPUT"X2 COORDINATE";P(
    3): IF P(3)>95THENP(3)=95
F4  1320 INPUT"Y2 COORDINATE";P(
    4): IF P(4)>41THENP(4)=41
6D  1330 INPUT"X3 COORDINATE";P(
    5): IF P(5)>95THENP(5)=95
91  1340 INPUT"FLAG";P(6): IFP(6
    )>5 THENP(6)=5
E1  1350 FOR PN=0TO6: POKE TA+PN
    ,P(PN):NEXT: POKE TA+PN,255
DB  1360 RETURN
CF  1370 PRINTCHR$(147): INPUT"X
    1 COORDINATE";P(1): P(0)=11:
    IFP(1)>95THENP(1)=95
7D  1380 INPUT"Y1 COORDINATE";P(
    2): IFP(2)>41THENP(2)=41
3C  1390 INPUT"X2 COORDINATE";P(
    3): IF P(3)>95THENP(3)=95
A4  1400 INPUT"Y2 COORDINATE";P(
    4): IF P(4)>41THENP(4)=41
```

```
5D  1410 INPUT"X3 COORDINATE";P(
         5): IF P(5)>95THENP(5)=95
D0  1420 INPUT"PEN";P(6): IFP(6)
         >3 THENP(6)=3
F3  1430 P(1)=P(1)AND254: P(3)=P
         (3)AND254: P(5)=P(5)AND254
03  1440 FOR PN=0TO6: POKE TA+PN
         ,P(PN):NEXT: POKE TA+PN,255
21  1450 RETURN
A6  1460 PRINTCHR$(147): INPUT"X
         C COORDINATE";P(1): P(0)=12:
         IFP(1)>95THENP(1)=95
D9  1470 INPUT"YC COORDINATE";P(
         2): IFP(2)>41THENP(2)=41
C0  1480 INPUT"DENSITY";P(3):IF
         P(3)>255 THENP(3)=255
18  1490 INPUT"SIZE";P(4): IFP(4
         )>2THENP(4)=2
88  1500 WI=(P(4)+1)*4
A4  1510 IF (P(1)+WI)>95 THEN P(
         1)=95-WI
90  1520 IF (P(2)+WI)>41 THEN P(
         2)=41-WI
98  1530 INPUT"FLAG";P(5): IF P(
         5)>5 THEN P(5)=5
21  1540 FOR PN=0TO5: POKE TA+PN
         ,P(PN):NEXT: POKE TA+PN,255
9A  1550 RETURN
44  1560 PRINTCHR$(147): INPUT"X
         C COORDINATE";P(1): P(0)=13:
         IFP(1)>47THENP(1)=47
EC  1570 INPUT"YC COORDINATE";P(
         2): IFP(2)>41THENP(2)=41
1F  1580 INPUT"DENSITY";P(3):IF
         P(3)>255 THENP(3)=255
65  1590 INPUT"SIZE";P(4): IFP(4
         )>2THENP(4)=2
91  1600 WI=(P(4)+1)*8: HI=(P(4)
         +1)*4:P(1)=P(1)AND254
F9  1610 IF (P(1)+WI)>47 THEN P(
         1)=47-WI
7B  1620 IF (P(2)+HI)>41 THEN P(
         2)=41-HI
81  1630 INPUT"FLAG";P(5): IF P(
         5)>5 THEN P(5)=5
45  1640 FOR PN=0TO5: POKE TA+PN
         ,P(PN):NEXT: POKE TA+PN,255
F6  1650 RETURN
19  1700 PRINTCHR$(147);:O$=""
24  1710 FOR I=0TOCC
33  1720 Z=PEEK(FA+I)
EC  1730 IF LEN(O$)+LEN(STR$(Z))
         +2 >=40 THEN PRINTO$: O$=""
E8  1740 O$=O$+" -"+STR$(Z)
42  1750 NEXT: PRINTO$
55  1760 GETI$:IFI$=""THEN1760
7E  1770 RETURN
```

Software for sale

If you think that one of our programs looks very interesting, but you can't afford the time to type it in then our software service will help you out.

It's three o'clock in the morning. You sit at the computer keyboard just finished a marathon typing session entering one of the superb programs from *Your Commodore*. Your fingers reach for the keyboard and press the letters R, U and N. You press RETURN, sit back and nothing happens.

Everyone has probably faced this problem. When it does happen it's a matter of spending hours searching through the program for any typing mistakes. No matter how lo ng you look or how many people help you, you can usually guarantee that at least one little bug slips through unnoticed.

The *Your Commodore* Software Service makes available all of the programs from each issue on both cassette and disk at a price of £6.00 for disk and £4.00 for cassette. None of the documentation for the programs is supplied with the software since it is all available in the relevant magazine. Should you not have the magazine then back issues are available from the following address:

INFONET LTD, Times House, 179 The Marlowes, Hemel Hempstead, Herts. HP1 1BB.
TEL: (0442) 48435

please contact this address for prices and availability.

The Disk

Programs on the disk will also be supplied as totally working versions, i.e. when possible we will not use Basic Loaders thus making use of the programs much easier. Unfortunately at the moment we cannot duplicate C16 and Plus/4 cassettes. However programs for these machines will be available on the disk.

What programs are available?

At the top of each article you will find a strap containing the article type, C64 Program etc. So that you can see which programs are available on which format you will also find a couple of symbols after this strap. The symbols have the following meaning:



This symbol means that the program is available on cassette.



These programs are available on disk.

Please Note

Since the programs supplied on cassette are total working versions of the program, we do not put disk only programs on tape. There is no sense in placing a program that expects to be reading from disk on to tape. YC

SEPTEMBER 1986

BACKDROPS — Sample backgrounds and sprites for use with the 3IN1 EDITOR published in August 1986.
ASSEMBLER 128 — Full C128 assembler. Same as JULY'86 issue.
ICON DRIVER — A small routine that allows you to move a sprite around the screen with a joystick. Useful if you want to develop an icon program (C64).
RECONFIGURE — Develop routines to alter the memory configuration of your C64 with ease.
CROSSWORD — Put your brain to work with this superb crossword program. Includes four crosswords for you to try (C64).
ALL CLEAR — Some interesting ways to clear the screen with this collection of routines (C64).
ADVENTURE GRAPHICS — Add graphics capability to our ADVENTURE AID program published in the May 1986 edition of Your Commodore (C64).

ORDER CODE
DISK YDSEP86 £6.00
TAPE YCSEP86 £4.00

OCTOBER 1986

CROSSWORD — See September issue.
POP UP MENUS — A superb routine that allows you to add pop-up menus to your C64.
PILOT — A full implementation of this extremely popular educational language for your C64.

ORDER CODE
DISK YDOCT86 £6.00
TAPE YCOCT86 £4.00

NOVEMBER 1986

Into The Eighties — now you can give your C64 80 column capability, with this program. You have access to two screens either the 40 column version or the new 80 column one.

C16 SOUND SAMPLER — now your C16 or Plus/4 can sound like any instrument you like with this sound sampler – Available on disk only.

C64 AUTOSAVE — You've been programming for hours and your computer crashes taking all of your work with it. Well, you can prevent this with our C64 Autosave. This will save your programs to disk or tape every five minutes automatically so you won't have too much work to catch up on.

DATAMAKER 128 & C64 — Two excellent datamaker programs one for the C128 and one for the C64.

ORDER CODE
DISK YDNOV86 £6.00
TAPE YCNOV86 £4.00

DECEMBER 1986

WIMP – Create your own graphics operating system in your own programs. Complete with pull down menus and sample icons.

REMEMBER THE PLUS/4 – An assembler for Plus/4 owners. Complete with a couple of new Basic commands including a MERGE facility.

ORDER CODE
DISK YDDEC86 £6.00
TAPE YCDEC86 £4.00

JANUARY 1987

SELECT MENU 128 — Add a menu program to your C128 disk collection.

DISK ARCHIVE — Now you can make a total backup of all your disks on to cassette for safe keeping. A complete disk uses five minutes of tape (C64).

TAPE HEADER — Find out where your cassette based programs start in memory. For the C16 (Jan Disk only).

ANIMATOR — Generate your own animated character sequences with this program for the C64.

DUMPER — Produce copies of your Plus/4 text and Hi-res screens with this handy screen dump program (Jan disk only).

Cassettes or disk are available back to March 1986. Please ring the Editorial office (01-437-0626) for details of these.

ORDER FORM – PLEASE COMPLETE IN BLOCK CAPITALS

NAME	QTY	TAPE/DISK	ORDER CODE	PRICE
February '86		TAPE (£4.00)	YC FEB 86	
February '86		DISK (£6.00)	YC FEB 86	
OVERSEAS POST £1				
			TOTAL	

NAME...

ADDRESS...

POSTCODE...

I enclose a cheque/postal order for £...... made payable to ARGUS SPECIALIST PUBLICATIONS LTD.

All orders should be sent to: YOUR COMMODORE, READERS SERVICES, ARGUS SPECIALIST PUBLICATIONS, 9 HALL ROAD, HEMEL HEMPSTEAD, HERTS HP2 7BH.
Please allow 28 days for delivery.

```
       ,6A,46,5E,76,BD,E4,42,EF,46
01  412 DATA 20,31,6C,6D,20,31,6C
       ,6C,CB,46,5E,8C,96,B6,AC,06
41  413 DATA FA,EF,49,CB,45,5E,25
       ,26,C3,46,1E,E3,46,76,BA,3E
39  414 DATA 26,3E,AC,06,FA,E3,5E
       ,CB,46,40,C3,40,E3,5F,CB,47
B4  415 DATA 40,C3,41,EF,42,C3,3E
       ,EF,A4,66,C4,42,8F,44,D6,75
35  416 DATA E6,46,C2,3E,E2,3E,FF
       ,9D,B8,B6,54,1E,66,30,90,3E
B5  417 DATA EF,A4,66,C4,42,8F,44
       ,D6,5C,A0,3E,96,A1,EF,86,66
68  418 DATA C4,42,EF,A4,66,C4,42
       ,8F,44,D6,4E,EF,B9,66,14,42
A3  419 DATA 0A,64,AD,EB,46,40,B6
       ,BE,B3,5E,B6,82,EB,46,40,C3
AC  420 DATA 40,EB,47,40,C3,41,0A
       ,E6,42,E4,75,FB,EE,44,DB,46
A1  421 DATA 45,8C,56,B1,1E,26,E4
       ,75,FB,46,45,DB,EE,44,BC,56
C1  422 DATA B1,26,46,07,FA,1E,41
       ,44,8D,28,00,03,FA,4E,4D,8D
07  423 DATA 38,08,00,00,4E,50,81
       ,00,04,FA,46,B0,CA,00,01,00
59  424 DATA 41,00,C3,FA,A9,3E,8D
       ,0C,08,A9,08,8D,0D,08,A9,00
31  425 DATA 85,FB,A9,08,85,FC,A0
       ,10,B1,FB,49,46,91,FB,C8,D0
F0  426 DATA F7,E6,FC,A5,FC,C9,27
       ,D0,EF,18,A9,00,AA,7D,E0,09
8A  427 DATA E8,E0,18,D0,F8,C9,2C
       ,F0,03,4C,E2,FC,60,EA,FF,FA
3D  428 DATA EA,FF,FA,EA,FF,FA,EA
       ,FF,FA,EA,FF,FA,EA,FF,FA,EA
56  429 DATA FF,FA,EA,EE,FA,A2,00
       ,BD,47,20,9D,10,01,E8,D0,F7
49  430 DATA A2,34,BD,AE,20,9D,00
       ,03,E8,D0,F7,EA,EA,A2,FF,9A
FA  431 DATA A9,00,85,2D,38,E9,01
       ,85,FE,A9,30,85,2E,E9,00,85
D0  432 DATA FF,A9,04,85,FC,A9,20
       ,85,FD,AD,21,D0,85,FB,4C,52
EF  433 DATA 01,00,00,00,00,00,00
       ,00,0C,08,00,00,9E,31,30,32
6E  434 DATA 30,38,00,00,00,01,00
       ,C0,66,00,77,62,6E,7E,76,6F
B5  435 DATA 6A,0B,62,6E,7E,76,6F
       ,48,C6,FC,A5,FC,C9,FF,D0,02
EC  436 DATA C6,FD,68,60,48,AD,20
       ,D0,49,03,8D,20,D0,C6,FE,A5
87  437 DATA FE,C9,FF,D0,02,C6,FF
       ,68,60,A0,00,B1,FC,C9,FA,D0
FD  438 DATA 18,EA,EA,EA,20,30,01
       ,B1,FC,AA,20,30,01,B1,FC,91
46  439 DATA FE,20,3D,01,CA,D0,F8
       ,F0,05,91,FE,20,3D,01,A6,FC
69  440 DATA CA,86,FC,E0,FF,D0,02
       ,C6,FD,A5,FE,C9,1F,A5,FF,E9
1D  441 DATA 08,90,C8,A5,FB,8D,20
       ,D0,A9,37,85,01,20,60,A6,20
C6  442 DATA BE,A6,A2,1F,BD,10,01
       ,9D,00,08,CA,D0,F7,A9,FA,4C
AC  443 DATA 34,03,4C,AE,A7,EE,EE
       ,EE,EE,EE,EE,EE,EE,EE,EE,EE
B2  444 DATA A9,00,A8,85,FB,85,FD
       ,A9,80,85,FC,A9,08,85,FE,B1
80  445 DATA FB,91,FD,C8,D0,F9,E6
       ,FC,E6,FE,A5,FC,C9,A0,D0,EF
73  446 DATA A9,08,AA,A8,20,BA,FF
       ,A9,0F,A2,34,A0,99,20,BD,FF
A0  447 DATA A9,01,85,2B,A9,08,85
       ,2C,A9,2B,A2,E6,A0,20,20,D8
CF  448 DATA FF,4C,66,FE,54,55,52
       ,42,4F,20,4D,45,4E,55,20,56
08  449 DATA 33,2E,30,EE,EE,EE,EE
       ,EE,EE,EE,EE,EE,EE,EE,EE,EE
F9  450 :
FE  451 :
FD  452 :::::::::::::::::::::::::
       ::::::::::
D4  453 :        TURBO MENU MAKER V
       3.0          :
91  454 :  WRITTEN BY :          L
       ES ALLAN  :
31  455 :  28 AITKINSON DRIVE  NEW
       PORT  IW  :
11  456 :::::::::::::::::::::::::
       ::::::::::
```

Continued from page 24

Labeller 64

Let your C64 take the hassle out of printing name and address labels. Your C64, a printer, some address labels and this program are all that you need.

By A.J. Lenton

How often have you had to type the address of a friend on to an envelope? Or perhaps you have a list of people that you need to send letters to quite often. *Labeller 64* will take the hassle out of this by keeping a record of the names and addresses that you use most often and printing a selection of them out at your command.

Loading Program

To load type LOAD "LABELLER 64", N where N=8 for disk and 1 for tape. The enter RUN: to start.

The first screen gives the option of altering the preset width and height of the labels and also the volume of the warning tone.

After these prompts have been answered the main menu will be displayed:

Load Data .... 1)
Save Data .... 2)
Enter Data .... 3)
Search Data .... 4)
Alter Data .... 5)
Delete Data .... 6)
Print Data .... 7)
End Program .... 8)
Enter choice

Load Data

To load an existing file from tape or disk press '1' followed by 'RETURN'.

You will be asked:

ARE YOU USING TAPE OR DISK? T/D

Press 'T' or 'D' as required.

Tape

If you are using tape the message:

POSITION TAPE CORRECTLY, THEN RETURN MOTOR WILL STOP AUTOMATICALLY

will be displayed. Next you will be asked to:

ENTER NAME OF FILE TO BE SAVED/LOADED OR 'Q' TO RETURN TO MENU

Enter the file name and press 'RETURN'. The cassette will start and the file will be loaded.

Disk

If using disk you will be asked to enter the drive number and prompted with 0. Amend if necessary. Press 'RETURN'.

You will then be asked:

IS DISK INSERTED Y/N

If you press 'N' you will be returned to the main menu. If you press 'Y' you will be asked:

DO YOU REQUIRE DISK FACILITJES? Y/N

If you press 'Y' you will be passed to the Primary Disk Functions (see below for an explanation of this facility).

If you press 'N' you will be asked to enter the name of the file to be loaded. If the file does not exist an error message will be shown and you will then be returned to the main menu. **Please note**: Only enter the original file name. Do not add the suffix '.L' as it appears in the dis directory. This is just an aid to identifying 'Labeller 64' files from anything else on the same disk.

Chaining Files

It is possible to chain files together. As each one is loaded the total new file will be sorted into order based on the first line of each label. If the memory becomes full the message:

Memory Full
1) to Print Out
2) to Save Data
3) to Delete Data
Enter Choice

will appear. Select the required option.

Disk Facilities

If you chose to move to disk facility routine the following menu will appear:

PRIMARY DISK FUNCTIONS
VALIDATE
INITIALISE
NEW
READ DIRECTORY
QUIT
PRESS V,I,N,R OR Q

If you wish to validate a Disk press "V" and the message:

VALIDATING
PLEASE WAIT

will appear.

If you wish to Initialise the disk drive press "I" and the message:

INITIALISING DISK
PLEASE WAIT

will appear.

If you wish to New a disk i.e. format a new one or reformat an existing one press "N". You will be asked:

ENTER DISK NAME

Enter the name that you wish to call the disk. If you pressed "N" by mistake just press return and you will return to the menu for this section. The next prompt is:

ENTER DISK ID NUMBER IF REQUIRED

If you are formatting a new disk enter any two character ID. If you are reformatting an old disk you may just press "RETURN" and the disk will be renamed and the directory cleared.
If you press "Q" you will be returned to Edit mode.

If you have chosen to read the Disk Directory it is printed on the screen. To temporarily stop the printout press the "SPACE" bar. To restart the display press the "SPACE" bar again. After the whole of the directory has been printed the following message appears:

RENAME
SCRATCH
OTHER
QUIT
CONTINUE
ENTER:
R,S,O,Q,C

If you wish to rename an ".L" file press "R" and you will get the prompt:

ENTER ORIGINAL NAME

Enter the name of the file that you wish to rename. You will then be asked to:

ENTER NEW NAME

Again enter your choice and you will be told that the program is:

RENAMING "old name"

If you fail to enter either an old name or a new one the program will exit this function.

If you choose to scratch a file you are asked to:

ENTER FILE NAME

When you have done this the chosen file will be scratched from the Disk.

If you press "O" you will be returned to the "Primary Disk Functions" menu, if you press "Q" to quit this mode you will be returned to Edit mode and if you enter "C" to continue you pass to the part of the Disk program which asks for you to enter the file name.

Save Data

To save a file to tape or disk press "2" followed by "RETURN".

The prompts are then similar as for loading. When positioning the tape press "RECORD & PLAY" before pressing "RETURN". When saving to disk you are given the option:

DO YOU WANT TO CREATE A NEW FILE OR OVER WRITE AN OLD ONE? (N/O)

If you press "N" and a file with the same name exists you will get an error message and you will be returned to the main menu.

Enter Text

To enter text press "3" followed by "RETURN". The screen will show the outline of the label, the number of the current lable being entered, the number of labels that the memory will accommodate (variable depending on the size of the labels), the number of lines on the label and the width of the label. To abort entry of text and return to the main menu press "F7". This may be done at any time during the entry of text.

Entry of text is as normal and editing and cursor keys work as normal with the following exceptions:

To insert text place the cursor at the position where the additional text is to be inserted. Press "INST" (SHIFT/DEL) and a reverse "I" will appear, in purple, at the bottom right corner of the screen. Any further text now entered will be inserted between the text to the left of the cursor and the text starting under the cursor. To turn this mode off press "INST" again.

To move the cursor swiftly to each end of the line being entered press "CTRL" and "←" together. If the cursor is not at the start of the line it will be moved there. If it is at the start it will be moved to the end.

At the end of each line press "RETURN" and the cursor will move down to the start of the next line.

The "UP" and "DOWN" cursor keys will only work if there are lines either above or below the one on which the cursor is present.

To complete entry of text either press "RETURN" continuously or press "F1" (the latter can be quicker if the label has been set for a large number of lines and you only wish to enter text on the first few).

In either case the message:

Is This Correct (Y/N)?

will appear. If you wish to modify the text press "N" and the cursor will reappear.

If you press "Y" the message:

Another One (Y/N)?

will appear. If you press "Y" the screen will clear ready for the next label.

If you press "N" you will be returned to the main menu.

A tone will sound at five characters from the end of a line and also at the end of the line. Also if you try to enter too much text on to a line a warning will appear:

LINE TOO LONG
Please Alter

To set auto repeat on all keys press "F3" and to cancel press "F5".

Search Text

To search for a label press "4" followed by "RETURN". The screen will clear and you will be asked to enter the search details. During this entry only the cursor left and cursor right keys can be used to move the cursor through the text. However, insert and delete work in a similar manner to the main entry of text.

When you have entered the details press "RETURN". The screen will clear and the message:

SEARCHING

will appear at the top of the screen. The program will then search through all the labels in the file and will list the number and first line of all labels which include the search details. Should the list reach the bottom of the screen the listing may be stopped by holding down any key. Obviously the more detail entered in the search pattern the fewer matches will be found.

When all valid entries have been found you will be asked to enter the number of the label to be viewed. Enter the number and press "RETURN". The requested label will be displayed and you will be asked if you want to see another one. If no valid entries are found the message:

ENTRY NOT FOUND
Do you wish to try again (Y/N)?

will be displayed.

Amend Label

To amend a label press "5" followed by "RETURN". Proceed as for SEARCH and when the required label

is displayed it may be amended as per entry of data.

Delete a Label

To delete a label press "6" followed by "RETURN".

Proceed as for SEARCH until the lable is displayed. The message:

IS THIS THE ONE TO BE DELETED Y/N

will appear. If you answer "N" the "Enter Search Details" screen will reappear.

If you enter "Y" the label will be deleted from the file and you will have the opportunity to delete another one.

Printout Labels

To printout labels press "7" followed by "RETURN".

The screen will clear and you will be given the option of either choosing the labels to be printed (useful if you only wish to print a small number from the file), choosing the labels NOT to be printed (i.e. if you wish to print most but not all the labels), or printing the whole file:

Do you wish to select
1) ADDRESSES TO BE PRINTED
2) ADDRESSES TO BE OMITTED
3) TOTAL PRINTOUT
Enter Selection Required

If you choose either "1" or "2" the screen will fill with the number and first line of all the labels in the file. Enter the appropriate numbers and press "RETURN" one at a time. If there are more than 20 labels in the file you can enter "C" to continue the listing. If you do not wish to see anymore press "P" to go to the printout routine. If you choose "3" you are passed straight to the printout routine.

In the printout routine you are first given the choice of printing to the screen or printer. If you select screen, a screen full of labels will be printed.

If you select printer you will first be given the opportunity to alter the device number of the printer (it is preset to 4). This is followed by the secondary address of the printer (preset to seven for lower case mode).

Next you are asked:

Do you want
Manual or
Auto paper feed
Enter "M" or "A"

The next prompt is:

Number of lines to be printed ll

where "ll" is the total number of lines set for the label. If you wish to print less lines, alter the number and press "RETURN".

You are then asked if you are using single or double width lables. Press "S" or "D" as appropriate.

Finally you are requested to enter the width of the paper in inches and prompted with "g". Amend this if necessary (this only applies if you are using double width labels and the measurement is taken from the extreme edges of the paper including the tractor perforations).

If you wish to interrupt the printing at any time hold down the "SPACE" bar until the message:

Do You Wish To Reposition Paper or Stop Printing

appears on the screen. To stop printing press "S" and to reposition the paper press "R".

Exit Program

To exit the program or clear the memory for further entries press "8" followed by "RETURN".

You will first be asked:

ARE YOU SURE (Y/N)?

If you press "N" you will be returned to the main menu with the existing file intact.

If you press "Y" you will be asked:

Do you want to run again (Y/N)?

If you press "Y" the memory will be cleared and you will be returned to the intitial screen.

If you press "N" the program will erase itself.

Getting It All In

The object code is listed in a format that must be entered using the *Hex Data Entry* program to be found elsewhere in this issue.

Late Ammendments

Since the copy for this article was set the author has made some alterations to the program. These are as follows:

1) The files are no longer sorted into order. This saves time during the operation of the program and also some memory.
2) It is now possible to exit a LOAD routine by holding down the SPACE bar.
3) If using disk it is also possible to abort a SAVE in the same manner and any file created will be scratched.
4) When the program is in search mode it is now possible to stop the search by pressing 's'.
5) When printing out labels the program now asks for the number of characters to be left between adjacent labels and it is now possible to set the number of lines between labels. YC

PROGRAM: LABELLER 64

Please use HEX DATA ENTRY to type in this program.

```
0801 0B 08 00 00 9E 32 30 36 :5D
0809 31 00 00 00 20 44 E5 A9 :FC
0811 0C 8D 20 D0 8D 21 D0 EA :5D
0819 A9 36 85 01 4C B2 63 E9 :65
0821 40 F7 40 9E 64 A4 19 D4 :A1
0829 1A 9B 1A 50 1B FE 1B 2A :BE
0831 1C C5 1C 79 1A 11 1B F5 :5B
0839 1B 14 03 F1 12 1D 12 A5 :F6
0841 11 7D 0C BD 11 EA 11 D0 :2B
0849 1D 39 1E 0B 12 02 12 26 :71
0851 12 2F 12 20 14 4A 1D 4E :D1
0859 1D 52 1D 56 1D 41 1D 38 :6A
0861 1D FC 13 84 1F 84 1F DF :42
0869 21 E2 1F E2 1F E5 23 1D :08

0871 20 1D 20 94 23 DF 21 24 :6A
0879 1F E4 1E 0B 14 98 10 BA :0D
0881 18 BE 18 C2 18 D0 18 00 :64
0889 19 00 19 2C 14 0A 17 F3 :75
0891 16 25 17 B5 17 6D 1F E9 :2B
0899 16 5B 17 47 17 7F 17 64 :F3
08A1 17 6D 17 76 17 88 17 91 :7A
08A9 17 11 18 CF 1C 93 1E DD :1D
08B1 1C 58 1F C0 1E 64 23 8E :2C
08B9 22 67 22 5A 0D 9B 0C 97 :65
08C1 0D C0 17 BC 0B 6D 0C ED :03
08C9 12 FC 12 6A 23 CA 12 E7 :D1
08D1 0E 6D 14 CC 15 15 13 3C :70
08D9 16 A1 16 3A 18 55 18 4E :EB

08E1 1E 6D 1E 2E 1F EB 1E A8 :19
08E9 18 3F 13 A1 18 6E 18 0D :57
08F1 19 1A 19 46 0C 9A 17 27 :51
08F9 19 57 0C CE 16 40 0C 89 :A5
0901 20 76 20 B4 20 6A 20 64 :58
0909 20 70 20 FB 20 CA 20 95 :2C
0911 13 C0 13 DE 13 0E 21 E0 :EE
0919 20 70 23 0F 24 AF 21 6A :C2
0921 24 6A 24 6A 24 E6 39 D0 :53
0929 02 E6 3A A0 00 B1 39 0A :29
0931 B0 14 0A B0 07 0A A8 B0 :5D
0939 1B 4C 99 09 0A A8 B0 03 :E4
0941 4C C5 0A 4C D7 09 AA BD :5B
0949 26 08 B5 3F BD 27 08 85 :04
```

```
0951 40 6C 3F 00 B9 06 28 29 :46
0959 FB 85 10 F0 18 10 05 B9 :10
0961 04 28 85 66 B9 02 28 85 :C4
0969 64 B9 03 28 85 65 A9 00 :7D
0971 85 70 4C 26 09 85 70 B9 :74
0979 00 28 85 61 B9 01 28 85 :BE
0981 62 B9 02 28 85 63 B9 03 :0C
0989 28 85 64 B9 04 28 85 65 :99
0991 B9 05 28 85 66 4C 26 09 :F7
0999 B9 06 28 29 FB 85 11 F0 :75
09A1 14 10 05 B9 04 28 85 6E :DE
09A9 B9 02 28 85 6C B9 03 28 :B8
09B1 85 6D 4C 26 09 B9 00 28 :4E
09B9 85 69 B9 01 28 85 6A B9 :D2
09C1 02 28 85 6B B9 03 28 85 :3C
09C9 6C B9 04 28 85 6D B9 05 :B0
09D1 28 85 6E 4C 26 09 BE 06 :D2
09D9 28 E0 05 F0 65 A5 10 99 :9E
09E1 06 28 F0 78 30 0D A5 64 :C7
09E9 99 02 28 A5 65 99 03 28 :75
09F1 4C 26 09 84 62 B9 04 28 :4F
09F9 C5 32 90 12 85 30 B9 03 :F9
0A01 28 85 2F B9 02 28 A8 91 :BD
0A09 2F C8 A9 FF 91 2F A5 66 :60
0A11 C5 32 90 1C A4 64 C8 B1 :E5
0A19 65 C9 FF F0 03 20 86 1D :2D
0A21 A4 62 C8 C8 98 A4 64 91 :14
0A29 65 C8 A9 28 91 65 A5 66 :9E
0A31 A4 62 99 04 28 A5 64 99 :9D
0A39 02 28 A5 65 99 03 28 4C :94
0A41 26 09 A5 10 D0 A0 F0 05 :2F
0A49 A9 01 99 06 28 84 2F D0 :7F
0A51 03 20 1B BC 20 AA B1 A4 :67
0A59 2F 4C E7 09 A6 70 85 70 :F9
0A61 10 04 38 20 23 BC A5 65 :62
0A69 05 64 D0 28 A5 61 F0 45 :7C
0A71 10 22 C9 90 B0 1E 29 0F :1A
0A79 F0 1A C9 09 90 0C E9 08 :D2
0A81 AA BD DE 0E 25 63 D0 0C :91
0A89 F0 BE AA BD DE 0E 25 62 :A3
0A91 05 63 F0 B4 A5 61 99 00 :A9
0A99 28 A5 62 99 01 28 A5 63 :24
0AA1 99 02 28 A5 64 99 03 28 :28
0AA9 A5 65 99 04 28 A5 66 99 :2A
0AB1 05 28 4C 26 09 A9 01 99 :73
0AB9 06 28 4A 99 02 28 99 03 :91
0AC1 28 4C 26 09 A0 00 B1 39 :D5
0AC9 29 1F 8D CF 0A D0 03 4C :99
0AD1 EB 0A 4C 1D 0B 4C 66 0B :48
0AD9 4C 04 0B 4C 33 0B 4C 8A :22
0AE1 0B 4C 42 0B 4C 54 0B 4C :96
0AE9 AE 0B C8 84 10 B1 39 85 :41
0AF1 65 C8 B1 39 85 64 A5 39 :18
0AF9 69 02 85 39 90 1B E6 3A :64
0B01 4C 26 09 C8 84 11 B1 39 :6C
0B09 85 6D C8 B1 39 85 6C A5 :DA
0B11 39 69 02 85 39 90 02 E6 :F0
0B19 3A 4C 26 09 A0 06 B1 39 :63
0B21 99 60 00 88 D0 F8 84 10 :95
0B29 A5 39 69 06 85 39 90 E9 :B9
0B31 B0 E5 A0 06 B1 39 99 68 :DC
0B39 00 88 D0 F8 84 11 4C 29 :EE
0B41 0B 84 64 C8 84 10 B1 39 :32
0B49 85 65 E6 39 D0 CB E6 3A :19
0B51 4C 26 09 84 6C C8 84 11 :03
0B59 B1 39 85 6D E6 39 D0 B9 :0A
0B61 E6 3A 4C 26 09 A5 39 A6 :00
0B69 3A 69 02 90 02 E8 18 86 :0C
0B71 66 85 65 C8 B1 39 85 64 :BD
0B79 65 65 85 39 86 3A 90 02 :14
0B81 E6 3A A9 FF 85 10 4C 2C :3E
0B89 09 A5 39 A6 3A 69 02 90 :44
0B91 02 E8 18 86 6E 85 6D C8 :41
0B99 B1 39 85 6C 65 6D 85 39 :EC
0BA1 86 3A 90 06 E6 3A A9 FF :D3
0BA9 85 11 4C 2C 09 C8 B1 39 :5F
0BB1 AA C8 B1 39 85 3A 86 39 :48
0BB9 4C E3 A8 A5 10 D0 06 20 :B0
0BC1 DD BD 4C C9 0B 20 D2 0B :2C
0BC9 20 BA 0C 20 3B AB 4C 26 :0D
0BD1 09 A6 64 10 0B A9 2D 8D :61
0BD9 00 01 20 6E 15 4C E6 0B :C5
0BE1 A9 20 8D 00 01 A2 00 86 :71
0BE9 62 A0 00 C8 38 A5 65 FD :4B
0BF1 5C 22 85 65 A5 64 FD 5D :17
0BF9 22 85 64 B0 EE A5 65 7D :3F
0C01 5C 22 85 65 A5 64 7D 5D :A7
0C09 22 85 64 E0 08 F0 0C A9 :44
0C11 00 C5 62 D0 04 C0 01 F0 :1B
0C19 0C E6 62 18 98 69 2F 8D :95
0C21 01 01 EE 21 0C E8 E8 E0 :75
0C29 0A D0 BE AC 21 0C 84 64 :65
0C31 A9 00 85 65 99 00 01 A0 :00
0C39 01 8C 21 0C 84 66 60 20 :7C
0C41 D7 AA 4C 26 09 20 DD 17 :97
0C49 A5 65 F0 07 20 3B AB C6 :82
0C51 65 D0 F9 4C 26 09 20 DD :2C
0C59 17 A5 65 38 E5 D3 90 09 :6B
0C61 AA F0 06 20 3B AB CA D0 :AB
0C69 FA 4C 26 09 A6 64 A5 65 :D1
0C71 85 22 A5 66 85 23 20 25 :33
0C79 AB 4C 26 09 A5 D3 38 E9 :4C
0C81 0A B0 FC 49 FF 69 01 D0 :FA
0C89 D7 A2 01 86 23 CA 86 22 :E3
0C91 CA E8 BD 00 01 D0 FA 4C :7C
0C99 25 AB A5 10 F0 20 68 F0 :0A
0CA1 28 68 85 6D 68 85 6C 48 :35
0CA9 48 BA 86 48 A5 6C 48 A5 :F7
0CB1 6D 48 A5 64 48 A5 65 48 :75
0CB9 A9 01 48 4C 26 09 20 B2 :CF
0CC1 0E D0 44 20 AA B1 68 D0 :8A
0CC9 D8 A5 64 85 25 A5 65 85 :AC
0CD1 24 20 28 0D 20 B2 0E D0 :8E
0CD9 16 20 AA B1 A5 64 85 6C :84
0CE1 A5 65 85 6D A5 25 85 64 :6C
0CE9 A5 24 85 65 4C A8 0C 48 :F8
0CF1 48 BA 86 48 20 40 0D A5 :01
0CF9 25 A4 24 20 91 B3 20 40 :38
0D01 0D A9 00 48 4C 26 09 20 :1E
0D09 0C BC 68 D0 11 20 28 0D :99
0D11 48 48 BA 86 48 20 40 0D :7E
0D19 20 FC BB 4C FF 0C 68 A8 :EC
0D21 68 20 91 B3 4C 11 0D 68 :C4
0D29 85 3F 68 85 40 E6 3F D0 :54
0D31 02 E6 40 A0 06 68 99 60 :FB
0D39 00 88 D0 F9 6C 3F 00 68 :72
0D41 85 3F 68 85 40 E6 3F D0 :6C
0D49 02 E6 40 A0 00 B9 61 00 :53
0D51 48 C8 C0 06 D0 F7 6C 3F :46
0D59 00 48 48 BA 86 48 A5 10 :F9
0D61 F0 10 A5 64 48 A5 65 48 :38
0D69 A9 00 48 A9 01 48 48 4C :9A
0D71 26 09 20 B2 0E D0 06 20 :20
0D79 AA B1 4C 63 0D A2 00 B5 :A9
0D81 61 48 E8 E0 06 D0 F8 A9 :B7
0D89 81 48 A9 80 48 0A 48 05 :58
0D91 F1 4C 26 09 68 85 25 A0 :D8
0D99 01 B1 39 85 45 48 C8 B1 :C3
0DA1 39 85 46 48 18 BA 86 24 :73
0DA9 A5 25 F0 0B 8A 69 09 4C :5A
0DB1 BD 0D 18 69 11 D0 10 8A :68
0DB9 69 11 AA BC 00 01 30 38 :47
0DC1 C0 05 F0 EE 18 69 09 E8 :7F
0DC9 BC 00 01 C4 46 D0 EB E8 :82
0DD1 BC 00 01 C4 45 D0 E3 AA :5D
0DD9 CA 03 F1 86 48 A9 06 A4 :3B
0DE1 25 D0 02 A9 0E 18 65 24 :08
0DE9 A8 B9 00 01 9D 00 01 88 :5E
0DF1 CA C4 24 D0 F4 9A D0 02 :0E
0DF9 A6 24 E0 16 B0 05 A2 4D :42
0E01 4C 37 A4 A5 39 A6 25 69 :86
0E09 01 85 39 90 02 E6 3A A4 :22
0E11 48 C8 A5 3A 99 00 01 C8 :03
0E19 A5 39 99 00 01 A0 06 B1 :71
0E21 45 C9 05 F0 33 A5 10 F0 :93
0E29 2A BA F0 17 A9 04 48 A0 :EF
0E31 06 A9 01 91 45 A0 02 A5 :1E
0E39 64 91 45 C8 A5 65 91 45 :63
0E41 4C 26 09 A5 64 A4 65 20 :16
0E49 91 B3 A9 05 48 20 89 10 :B5
0E51 4C 26 09 8A D0 15 F0 F2 :D9
0E59 8A F0 0D A5 10 D0 03 20 :C2
0E61 AA B1 A9 44 48 4C 38 0E :9F
0E69 4C 48 B2 20 B2 0E D0 09 :A0
0E71 20 AA B1 A9 04 48 4C 32 :03
0E79 0E 20 89 10 68 85 2F 68 :50
0E81 85 30 68 85 6D 68 85 6C :45
0E89 68 A8 68 20 91 B3 20 40 :DF
0E91 0D A5 6C A4 6D 20 91 B3 :2B
0E99 20 40 0D A5 30 48 A5 2F :8E
0EA1 48 A9 05 48 BA E0 16 B0 :65
0EA9 03 4C 01 0E 4C 26 09 A5 :45
0EB1 64 05 65 D0 18 A5 61 10 :0A
0EB9 14 C9 90 B0 11 29 0F F0 :02
0EC1 0F C9 09 90 0E E9 08 A8 :F0
0EC9 B9 DE 0E 25 63 60 A8 60 :C2
0ED1 A9 01 60 A8 B9 DE 0E 25 :96
0ED9 62 05 63 60 7F 3F 1F 0F :33
0EE1 07 03 01 00 BA 78 28 10 :FA
0EE9 03 4C 30 AD 68 85 46 68 :17
0EF1 85 45 70 20 A0 06 B1 45 :12
0EF9 D0 0B 88 B1 45 99 61 00 :D0
0F01 88 10 F8 30 0B A0 02 B1 :DD
0F09 45 85 64 C8 B1 45 85 65 :81
0F11 90 0D B0 5F A0 02 B1 45 :71
0F19 85 64 C8 B1 45 85 65 68 :FB
0F21 85 6D 68 85 6C 85 0D 98 :20
0F29 30 4C A5 65 65 6D 85 65 :C5
0F31 A5 64 65 6C 85 64 70 64 :9D
0F39 A5 65 91 45 88 A5 64 91 :38
0F41 45 68 85 6D 68 85 6C A5 :DA
0F49 0D 30 2E A5 6C 10 06 A5 :A1
0F51 64 30 06 10 41 A5 64 30 :C5
0F59 0F C5 6C 30 0B F0 03 4C :41
0F61 99 0F A5 6D C5 65 90 2E :51
0F69 68 85 3A 68 85 39 9A 58 :0D
0F71 4C 26 09 4C CB 0F 4C 28 :F8
0F79 10 A5 6C 10 06 A5 64 30 :8E
0F81 06 10 E5 A5 64 30 0F C5 :8E
0F89 6C F0 05 10 DB 4C 99 0F :D9
0F91 A5 65 C5 6D B0 D2 58 68 :06
0F99 68 4C 26 09 A0 06 B1 45 :71
0FA1 C9 05 F0 21 20 DB 10 A0 :F9
0FA9 02 B1 45 AA C8 B1 45 A8 :B4
0FB1 8A 20 91 B3 A5 66 45 6E :E9
0FB9 85 6F A5 61 20 6A B8 20 :B2
0FC1 89 10 4C 99 0F 4C 48 B2 :4C
0FC9 86 48 BA 86 57 A6 48 9A :83
0FD1 98 30 0E A5 64 A4 65 20 :15
0FD9 91 B3 A9 00 A0 06 91 45 :2D
0FE1 38 4C FF 0F A5 6E 85 0D :C1
0FE9 45 66 85 6F A5 61 20 6A :F3
0FF1 B8 A0 06 B9 60 00 88 91 :FE
0FF9 45 D0 F8 18 A0 06 A6 57 :AB
1001 BD 01 01 99 68 00 E8 88 :C6
1009 D0 F6 86 57 B0 D6 20 81 :0E
1011 12 A4 0D 10 03 20 93 12 :35
1019 9A C9 02 F0 05 A6 48 4C :5F
1021 68 0F 4C 99 0F A0 06 B1 :AE
1029 45 C9 05 F0 98 A5 6C 85 :C0
1031 30 A4 6D 84 2F 20 DF 10 :43
1039 A5 6E 85 0D 45 66 85 6F :54
1041 A5 61 20 6A B8 20 89 10 :46
1049 68 A8 68 20 DF 10 20 81 :58
1051 12 A4 0D 10 03 20 93 12 :75
1059 C9 02 D0 03 4C 99 0F BA :EC
1061 BD 01 01 85 3A BD 02 01 :DC
1069 85 39 20 FC BB 20 40 0D :3E
1071 A5 30 A4 2F 20 91 B3 20 :08
1079 40 0D A5 45 48 A5 46 48 :45
1081 A9 05 48 4C 26 09 A0 06 :BF
1089 A9 00 91 45 B9 60 00 88 :15
1091 91 45 D0 F8 60 BA 78 68 :BF
1099 10 03 4C 30 AD 85 2F A0 :1A
10A1 01 68 D1 39 D0 18 85 46 :4D
10A9 68 C8 D1 39 D0 13 85 45 :44
10B1 A5 39 69 01 85 39 90 02 :F5
10B9 E6 3A 24 2F 66 2F 4C F5 :0E
10C1 0E 8A A4 2F C0 05 F0 09 :40
10C9 BA 18 69 09 AA 9A 4C 98 :A3
10D1 10 69 10 AA 9A 4C 98 10 :FC
10D9 A5 6C A4 6D C6 11 85 6A :2C
10E1 84 6B 49 FF 2A B0 16 A5 :C5
10E9 6A 49 FF 85 6A A5 6B 49 :1A
10F1 FF 85 6B E6 6B D0 02 E6 :07
10F9 6A A2 FF D0 02 A2 00 A9 :01
1101 00 86 6E 85 6C 85 6D A2 :AF
1109 90 86 69 A0 00 18 A6 6A :C9
1111 D0 18 A6 6B 86 6A A6 6C :B8
1119 86 6B 69 08 C9 20 D0 EE :9C
1121 A9 00 85 69 85 6E 60 69 :11
1129 01 06 6B 26 6A 10 F8 38 :08
1131 E5 69 B0 EC 49 FF 69 01 :F5
1139 85 69 90 08 E6 69 F0 05 :0B
1141 66 6A 66 6B 60 4C 7E B9 :3A
1149 E6 11 A5 69 F0 13 C9 90 :04
1151 90 14 A2 FF E8 85 69 DD :77
1159 A5 B1 90 0A F0 F6 4C 48 :FF
1161 B2 85 6C 85 6D 60 38 E9 :A5
1169 A0 24 6E 10 02 C6 11 A2 :0F
1171 69 C9 F9 10 1E 20 99 B9 :E3
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1179 A5 11 F0 01 60 E6 11 A5 :F6
1181 6D 49 FF 85 6D A5 6C 49 :CB
1189 FF 85 6C E6 6D D0 ED E6 :19
1191 6C D0 E9 A8 A5 69 29 80 :C5
1199 46 6A 05 6A 20 B0 B9 4C :98
11A1 7B 11 A5 10 25 11 D0 03 :53
11A9 20 D5 11 A5 64 25 6C 85 :27
11B1 64 A5 65 25 6D 85 65 4C :83
11B9 26 09 A5 10 25 11 D0 03 :06
11C1 20 D5 11 A5 64 05 6C 85 :7F
11C9 64 A5 65 05 6D 85 65 4C :1B
11D1 26 09 A5 10 F0 04 20 4B :37
11D9 11 60 E6 10 A5 11 D0 03 :02
11E1 20 4B 11 20 AA B1 60 A5 :89
11E9 10 D0 05 20 AA B1 E6 10 :69
11F1 A5 64 49 FF 85 64 A5 65 :D0
11F9 49 FF 85 65 4C 26 09 20 :01
1201 48 12 29 04 F0 36 D0 2B :F3
1209 20 48 12 29 03 F0 2D D0 :FC
1211 22 20 48 12 29 01 F0 24 :15
1219 D0 19 20 48 12 29 02 F0 :78
1221 1B D0 10 20 48 12 29 05 :A6
1229 F0 12 D0 07 20 48 12 29 :DE
1231 06 F0 09 A9 FF 85 64 85 :D2
1239 65 4C 26 09 A9 00 85 64 :DB
1241 85 65 4C 26 09 A5 10 25 :AE
1249 11 F0 25 A5 64 30 06 A5 :A2
1251 6C 30 14 10 04 A5 6C 10 :FE
1259 14 C5 64 30 0A D0 0E A5 :7E
1261 65 C5 6D 90 08 F0 03 A9 :FB
1269 02 60 A9 04 60 A9 01 60 :12
1271 A5 10 05 11 F0 03 20 18 :EA
1279 1A E6 10 20 1B BC A5 66 :B0
1281 30 07 A5 6E 10 13 A9 02 :D6
1289 60 A5 6E 10 E0 20 9C 12 :B0
1291 C9 04 F0 04 49 FF 29 03 :DF
1299 60 A5 61 C5 69 90 CE D0 :08
12A1 C6 A8 F0 C6 A5 62 C5 6A :D6
12A9 90 C3 D0 BB A5 63 C5 6B :60
12B1 90 BB D0 B3 A5 64 C5 6C :46
12B9 90 B3 D0 AB A5 65 C5 6D :2C
12C1 90 AB D0 A3 A9 04 60 A5 :CF
12C9 10 D0 08 A9 01 A6 61 D0 :44
12D1 0D F0 08 A6 65 D0 07 A6 :A7
12D9 64 D0 03 A8 B1 39 18 65 :20
12E1 39 85 39 90 02 E6 3A 4C :72
12E9 26 09 A0 01 B1 39 AA C8 :B5
12F1 B1 39 85 3A 86 39 4C 2C :F2
12F9 09 BA E0 10 90 11 A5 39 :D6
1301 69 01 48 A6 3A 90 01 E8 :A4
1309 8A 48 A9 A4 48 D0 DB 4C :52
1311 35 A4 68 C9 A4 D0 09 68 :7C
1319 85 3A 68 85 39 4C 26 09 :94
1321 BA C9 04 F0 0B C9 44 F0 :81
1329 07 C9 05 F0 0A 4C E0 A8 :EA
1331 8A 69 07 AA 9A D0 DB 8A :78
1339 69 0F D0 F7 20 DD 17 A0 :7A
1341 01 A5 65 F0 3F 0A 85 2F :0C
1349 B1 39 C5 2F 90 36 F0 34 :BA
1351 AA C8 B1 39 C9 D1 D0 1B :DC
1359 A5 2F 18 65 39 85 39 90 :81
1361 02 E6 3A A0 02 B1 39 F0 :9B
1369 03 4C ED 12 A9 FF 85 3A :CC
1371 4C E3 A8 8A 18 65 39 48 :47
1379 A4 3A 90 01 C8 98 48 A9 :FC
1381 A4 48 D0 D4 B1 39 18 65 :0F
1389 39 85 39 90 02 E6 3A 4C :1A
1391 26 09 A4 10 F0 11 A5 64 :AD
1399 48 A5 65 48 98 10 04 A5 :15
13A1 66 48 98 48 4C 26 09 A5 :45
13A9 70 10 03 20 23 BC A2 00 :46
13B1 B5 61 48 E8 E0 06 D0 F8 :93
13B9 98 48 4C 26 09 68 85 10 :1C
13C1 F0 0E 10 03 68 85 66 68 :38
13C9 85 65 68 85 64 4C 26 09 :71
13D1 A2 06 68 95 60 CA D0 FA :26
13D9 4C 26 09 68 85 11 F0 0E :2A
13E1 10 03 68 85 6E 68 85 6D :E3
13E9 68 85 6C 4C 26 09 A2 06 :60
13F1 68 95 68 CA D0 FA 4C 26 :12
13F9 09 A2 00 86 64 86 65 E8 :78
1401 86 10 4C 26 09 A2 00 86 :4B
1409 6D 86 6C E8 86 11 4C 26 :AD
1411 09 A2 00 86 64 E8 86 65 :AB
1419 86 10 4C 26 09 A2 00 86 :63
1421 6C E8 86 6D 86 11 4C 26 :EA
1429 09 A2 00 86 0B CA 8E 37 :1A
1431 14 4C 26 09 00 A5 13 D0 :55
1439 25 A0 01 B1 39 10 12 C9 :A7
1441 FB F0 0E C9 F9 F0 0A C9 :71
1449 FF F0 05 C9 80 F0 01 C8 :C1
1451 C8 98 18 65 39 85 39 90 :6E
1459 02 E6 3A 4C 26 09 A5 90 :FB
1461 29 40 D0 55 20 88 15 4C :90
1469 7D 14 A2 00 EE 37 14 86 :9F
1471 5C E8 86 10 A6 0B 86 3B :70
1479 D0 07 20 F9 AB A2 00 A0 :BD
1481 00 A5 13 F0 06 A5 90 29 :F7
1489 03 D0 2E AD 00 02 F0 A5 :2D
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3E51 06 9D F7 8F D4 04 D1 33 :3C
3E59 55 46 01 86 06 9D D4 0B :44
3E61 40 8A 02 F5 52 80 CE D1 :52
3E69 33 55 46 01 87 06 9D D4 :CD
3E71 0A 40 8A 02 F5 9E CE D1 :47
3E79 33 55 46 01 89 06 9D F5 :EF
3E81 46 01 8A 06 9D F7 8F F5 :EA
3E89 46 01 8B 06 9D F7 8F F5 :F5
3E91 46 01 8C 06 9D F7 8F D4 :F8
3E99 04 D1 33 55 46 01 0D 06 :1A
3EA1 9C F5 46 01 8D 06 9C F7 :DD
3EA9 8D D4 04 D1 C5 56 8A 02 :E0
3EB1 82 62 9E 64 3D 02 96 D4 :57
3EB9 04 D1 FE 54 FD 06 F5 9E :60
3EC1 CE D8 9E 04 96 F5 46 01 :C6
3EC9 14 06 9C F7 8F D4 04 D1 :FF
3ED1 20 57 FC 51 2A 22 A6 22 :0E
3ED9 A5 F5 8A 04 81 F7 DD F5 :17
3EE1 22 A5 F5 8A 04 82 F7 DF :2C
3EE9 F7 91 F8 8A 04 81 64 22 :F7
3EF1 1C 82 97 82 0A DD D0 46 :1D
3EF9 02 1F 1D D0 FC 51 2A 22 :D7
3F01 A5 D0 EC 22 1C 82 97 82 :5A
3F09 0A DD D0 46 01 1D D0 FC :97
3F11 51 2A 22 A5 C3 E7 46 01 :DA
3F19 20 D0 D1 FE 54 46 01 14 :32
3F21 06 9D D4 04 D1 33 55 46 :B6
3F29 01 1D 06 9D F5 46 01 9D :45
3F31 06 9D F7 8F F5 46 01 11 :8D
3F39 06 9D F7 8F F5 46 01 91 :95
3F41 06 9D F7 8F F5 46 00 06 :3E
3F49 9D F7 8F D4 04 D1 1A 58 :40
3F51 8A 19 94 D4 04 D1 7C 57 :2E
3F59 FC 51 2A 22 A6 22 A5 F5 :31
3F61 24 F7 DD 06 92 F5 22 A5 :CF
3F69 F5 52 02 04 82 F7 DF F7 :3C
3F71 91 F8 8A 04 82 64 D1 99 :00
3F79 57 FC 51 2A 22 A6 22 A5 :06
3F81 F5 24 F7 DD 06 92 F5 22 :63
3F89 A5 F5 8A 04 82 F7 DF F7 :EA
3F91 91 F8 8A 04 82 64 52 02 :EF
3F99 F5 FC 51 2A 22 A5 C3 CE :6D
3FA1 FC 51 2A 22 A5 C3 F5 8A :12
3FA9 09 82 F7 8C D4 04 D1 03 :D5
3FB1 58 52 02 F5 29 CE 52 19 :2D
3FB9 0A DD D0 46 2B 20 04 F1 :3F
3FC1 12 1C CC C9 CE C5 20 D4 :B6
3FC9 CF CF 20 CC CF CE C7 92 :A5
3FD1 20 07 F1 1E D0 4C 45 41 :0C
3FD9 53 45 20 C1 4C 54 45 52 :00
3FE1 20 03 F1 D0 FC 51 2A 22 :21
3FE9 A6 22 A5 F5 22 A5 C3 97 :2A
3FF1 8B F7 DD F8 8A FF 11 8A :50
3FF9 04 81 64 22 1C 82 97 82 :7B
4001 0A DD D0 46 02 1F 1D D0 :5B
4009 FC 51 2A 22 A5 D0 EC D1 :C1
4011 57 58 46 01 1D 06 9D F5 :95
4019 FC 51 2A 22 A5 C3 04 8C :03
4021 F7 83 04 82 64 46 01 9D :B8
4029 06 9D F5 9E 04 8B F7 83 :EE
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4039 F5 8A 02 8B F7 83 02 81 :6E
4041 62 46 01 11 06 9D F5 3D :DC
4049 02 8C F7 83 02 82 62 9E :07
4051 04 8C D4 03 9E 64 FC 51 :CE
4059 2A 22 A5 C3 04 8B D4 05 :0B
4061 22 A5 C3 64 8A 02 8C D4 :D7
4069 03 8A 62 3D 02 8B D4 03 :C9
4071 3D 62 D1 FE 54 46 02 93 :CA
4079 1E D0 9E 0B 94 D4 04 52 :C4
4081 03 65 8A 05 94 D4 05 8A :4E
4089 0B 81 72 52 02 05 94 D4 :07
4091 05 8A 03 81 72 52 03 05 :19
4099 94 D4 13 8A 03 81 72 23 :80
40A1 CB 9E CD 00 28 FC 76 3F :F0
40A9 20 A0 20 F8 D5 9E 6B 9E :02
40B1 6F 32 CB 9E CD 00 28 52 :05
40B9 02 05 94 F5 FC 76 3F 2B :15
40C1 9F 00 94 F7 8D D4 0C 8A :54
40C9 0B 82 6B 8A 00 82 60 D1 :74
40D1 BF 58 20 FF 00 28 CB 8A :68
40D9 CD 38 28 8A 0F 82 6F 52 :A5
40E1 C5 C2 55 3C 94 D4 04 D1 :98
40E9 9F 59 52 02 05 93 D4 04 :AE
40F1 D1 07 59 FC 9C 2A FD 00 :BD
40F9 07 A1 D0 EC D1 13 59 FC :37
4101 76 3F 20 9F FC 9C 2A 07 :C2
4109 A1 D0 EC AC 28 38 52 0F :8B
4111 EA 46 0C 1C 2A 0A F1 1E :AF
4119 D0 EC 8A 0F 82 6F 2F 55 :AF
4121 18 81 08 8C D4 04 D1 9C :55
4129 59 32 00 8B D4 04 D1 9F :FC
4131 59 52 19 0A DD D0 52 02 :1F
4139 E7 46 24 9C D0 52 45 53 :FE
4141 53 20 D2 C5 D4 D5 D2 CE :AD
4149 20 54 4F 20 43 4F 4E 54 :68
4151 49 4E 55 45 2C 20 D1 20 :9B
4159 54 4F 20 51 55 49 54 D0 :19
4161 9E 6F DC 61 46 01 0D 01 :BB
4169 9C F5 46 01 51 01 9C F7 :5B
4171 8D D4 04 D1 71 59 46 01 :32
4179 51 01 9D D4 04 D1 C9 59 :33
4181 46 02 93 1E D0 32 00 8B :8F
4189 D4 04 D1 9F 59 AC 28 00 :30
4191 52 09 E7 46 18 9C D0 52 :21
4199 45 53 53 20 D3 D0 C1 C3 :5A
41A1 C5 20 54 4F 20 43 4F 4E :A8
41A9 54 49 4E 55 45 D0 DC 61 :11
41B1 46 01 20 01 9C D4 04 D1 :04
41B9 BD 59 52 02 F5 29 CE D8 :46
41C1 46 37 93 96 C4 4F 20 D9 :DB
41C9 4F 55 20 D7 41 4E 54 20 :E2
41D1 D0 52 49 4E 54 4F 55 54 :C8
41D9 20 4F 4E 20 D3 43 52 45 :17
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Next Month

There's still a large section of the program left for you to type in. This will be published in *Your Commodore* March 1987.

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OOPS!

A number of people seem to be having problems with the *Remember the Plus/4* article that appeared in the December 1986 issue of *Your Commodore*.

The main problem seems to be that people are not noticing that there is a change in the address in Fig 6 – The Merge Routine.

The change occurs 19 lines from the bottom of page 82. The line starting E830 is the end of the Merge routine. The line starting EBF8 is the start of the Assembler. When entering this section of code do make sure that you change the addresses with the M command before entering the EBF8 line.

A number of symbols were also missing from the text. These were mainly > signs and $ signs. If your knowledge of machine code isn't good enough to sort out what symbols are missing then a corrected copy of the article is available. If you require a copy of this article then send an A4 stamped addressed envelope to:

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Caption Competition

Since Brian Clough has entered the computer games industry we thought that it would be apt to print a picture of him, and what better excuse than a caption competition. Here he is receiving a bottle of Bell's whiskey from Mr Jingle himself. Seems to have split some of his shirt already! If you can think of a witty caption, then send it off to us by Friday 28 February 1987. The best caption will win £5. Send your entry to: Brian Clough Caption Competition, *Your Commodore*, 1 Golden Square, London W1R 3AB.

Congratulations

There were 25 winners in our Melbourne House spot the difference competition featured in the November issue of *Your Commodore*. Each winner will receive a copy of the Melbourne House C16 Collection.

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